NAVY MEDICINE

January-February 1994

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COVER: VADM Donald F. Hagen, MC, Surgeon General of the Navy, reports on the state of the Medical Department in an interview with *Navy Medicine*, see page 18. Photo by HM2 Dan Kelly, NSHS, Bethesda, MD.

Rethinking Tactical Medical Support in the Fleet

CAPT Arthur M. Smith, MC, USNR

The Navy is beginning to explore and implement alternatives to a smaller carrier force. This includes changes in the number and types of ships in new battle groups. During deployments, elements of a battle group may be split into smaller configurations of ships and dispersed over larger areas to provide more extensive coverage of a region. How will medical care be made available on many of these "dispersed ships," most having only modest medical facilities, neither configured nor manned to manage the large numbers of casualties that may suddenly arise from a single mishap at sea?

Innovative programs are needed! On land, the British Army Parachute Clearing Troop developed mobile surgical teams who backpacked all equipment needed for life-saving interventions. These provided their major surgical capability in the Falklands. The Israelis formed small, highly mobile, independent resuscitation and emergency surgical units with their own transportation and carrying minimal equipment. They were configured for air drop or backpack, and were used for surgical support of their cross-canal attack against the Egyptians in 1973.

In 1990, during the prelude to the Gulf War, British maritime forces placed a surgical support team aboard an ammunition ship, *Fort Grange,* to supply forward located emergency stabilizing surgery to injured fleet personnel. This included a forward deployment team which carried its own gear. The team was capable of going forward aboard a damaged ship and could both resuscitate and stabilize casualties before transferring them. The team could then act as escorts to undertake continuing care.

Our new naval strategy has a need for maintaining the sustainability of relatively isolated ships which would ordinarily be dangerous locations for treating and holding casualties. Hostage rescue efforts at sea have previously utilized specially trained medical personnel who were placed aboard targeted ships via helicopter through either direct landings, rope drops, or other ingenious methods, for the purpose of treating casualties early, and saving lives. Under "From the Sea," rather than splitting a task force medical team among a dispersed task group, or attempting oftentimes dangerous ambulance mercy flights from affected ships, innovative means for bringing specially trained operational medical teams to them would appear imperative. Bringing help quickly to the scene, where advanced treatment can be started immediately, can actually save lives!

Every student of naval history recognizes the dangers existing aboard any underway ship, in war or peacetime, where even minor accidents can develop into major tragedies for some crewmembers. The Navy ordered a "Safety Standdown" in 1989 after 10 accidents at sea and in the air, within 3 weeks, killed 10 Navy personnel and injured at least 71. As former CNO ADM Carlisle Trost noted at the time, "The bottom line is that safety of our personnel is a fundamental obligation and responsibility of leadership." These words still ring true today. Medical capabilities at sea are an integral part of that same safety net! ❑

Dr. Smith is Clinical Professor of Surgery and Military Medicine at the Uniformed Services University of the Health Sciences (USUHS), Bethesda, MD, and Professor of Surgery (Urology) at the Medical College of Georgia, Augusta, GA.

World War II *Comfort* Crew Reunites

Twenty-seven former World War II Army and Navy crewmembers of hospital ship USS *Comfort* (AH-6), including doctors, nurses, medics, machinist mates, boatswain's mates, electricians, and firemen recently gathered on board the current USNS *Comfort* (T-AH 20), lay berthed in Baltimore, MD, for a first-ever reunion on board their namesake ship.

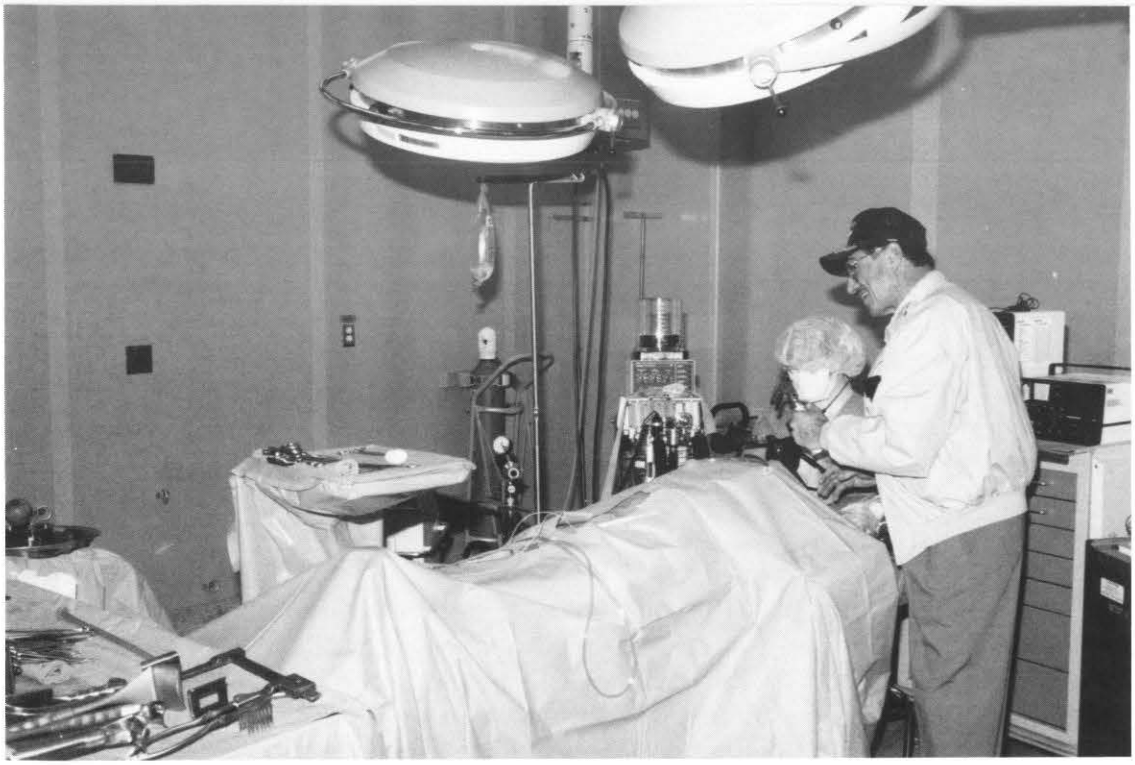
"This was a great opportunity for former crewmembers to reflect on past memories, their sacrifices, and their service to our country during World War II," said LCDR Jim Brado, MSC, the hospital ship's assistant officer-in-charge and public affairs officer. "We want them to know they're not forgotten."

Since USNS *Comfort* (T-AH 20) is the third ship to bear the name, this reunion had special meaning for many former crewmembers who remember serving their country on the World War II namesake.

USS *Comfort* (AH-6) was commissioned by the Navy on 5 May 1944. She replaced the original hospital ship USS *Comfort* (AH-3) which distinguished herself in World War I.

Comfort's World War II mission began after she set sail for the South Pacific to care for Allied sailors and soldiers wounded during the island-hopping campaign against the forces of the Japanese empire. (The hospital ship was operated by a Navy crew but Army medical personnel staffed the

Army/Navy crewmembers of the World War II hospital ship USS *Comfort* (AH-6) gather on the deck of the Navy's current USNS *Comfort* (T-AH 20).



What a modern hospital ship's operating room looks like.

medical treatment facility aboard.) During that campaign, the vessel had six cruises and won two battle stars. She was decommissioned on 19 April 1946 and transferred to the Army on the same day.

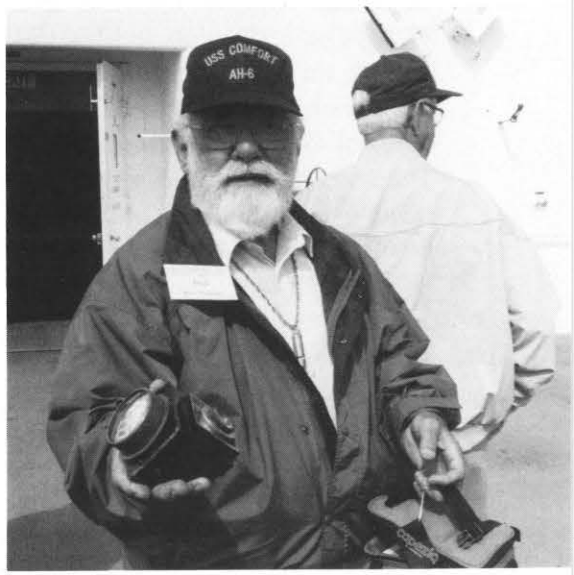
Sea stories and war memories abounded throughout the reunion, rekindling old friendships and entertaining the present *Comfort* crew, as the veteran Navy crewmembers and Army medics from the 205th Hospital Complement toured the mammoth ship. Many of them were amazed that the modern day vessel has 12 operating rooms, 50 combat casualty receiving emergency rooms, 100 intensive care unit (ICU) beds, and was the first ship to have a CAT scanner afloat.

Twelve reunion shipmates recalled in great detail the fateful day, 28 April 1945 when a kamikaze crashed through their ship's superstructure. With approximately 500 patients on board from the Okinawa campaign, she was steaming 50 miles from the coast and traveling fully lit in accordance with the Geneva Convention when the kamikaze hit the starboard side of the deck amidships killing 28 persons, including 6 nurses. Forty-eight other people were injured. According to one crewmember, the enemy plane penetrated the ship, finally stopping in an operating room, where doctors were performing surgery. That is where most of the deaths occurred. Another crewmember brought the actual kamikaze's gunsight with him to the reunion.

The heavily damaged ship was still able to proceed to Guam where it received a dispatch from ADM Chester Nimitz, then Commander-in-Chief, Pacific Fleet, highly commending both the Army and Navy crew for their cool and efficient response to the attack.

The present day *Comfort* has a sister ship, the USNS *Mercy* (T-AH 19) homeported in Oakland, CA. Both ships are part of the Military Sealift Command and are currently in Reduced Operating Status (ROD); the ship, its medical equipment, and supplies are maintained by small crews of approximately 44 Navy personnel and 20 civilian merchant mariners.

Comfort's crew keeps the ship and her medical treatment facility ready to achieve full operating status (FOS) within 5 days of activation for wartime contingency, or a humanitarian or disaster relief mission. When the ship is activated, the medical staff is composed of Navy personnel who come from over 10 Navy medical facilities, but primarily from the National Naval Medical Center, Bethesda, MD. ❑



Kamikaze gunsight: Bill Fadden shows off a souvenir from that day nearly 49 years ago when a suicide plane dove into his hospital ship.

—Story by LCDR Jim Brado, MSC, USNS *Comfort*. Photos by Tom Walsh, MSCLANT, Bayonne, NJ.

Reserve Dental Exercise JOTS '93

Members of the 4th Dental Battalion, part of the 4th Marine Division, spent 17 days on active duty in May 1993 treating the inhabitants of the island of Carriacou located just 20 miles north of Grenada in the Caribbean. The exercise provided a rewarding treatment environment unlike anything in a typical Navy dental clinic.

Tasking

Members of the American diplomatic community in Grenada requested dental support through the State Department and the USCINCLANT command. USCINCLANT directed the Marine Corps Reserve to provide a field dental facility to treat residents of Carriacou and nearby smaller islands. Called JOTS '93 for Joint Overseas Training Service, the operation included three Naval Reserve dentists and seven dental technicians.

The 4th Medical Logistics Company in Newport News, VA, shipped field dental equipment to Grenada via U.S. Air Force transport. Once in Grenada, a Grenadian coast guard cutter transported the equipment to Carriacou. There dental technicians and dental officers loaded it onto waiting trucks provided by Naval Mobile Construction Battalion No. 5 which was also working on the island.

Carriacou, a picturesque Caribbean island of roughly 13 square miles, is inhabited by 6,000 citizens of the south Caribbean nation. The word "Carriacou" is a derivative of a Carib Indian name meaning "island of many reefs." Scores of reefs surrounding the island make the typically blue Caribbean waters vary in shade from green to aqua. Not as developed for tourists as Grenada, boat building and raising farm animals are the main occupations of the residents.

During a site visit several months before the exercise, CDR Bob Carney had met with several of the community leaders on Carriacou. It was decided that the best place for the dental clinic would be in one of the classrooms at the Hillsborough Middle School.

In addition to the field dental equipment, there was a dental chair and compressed air unit at the school left by members of a Canadian dental group that had spent time on the island in the late 1980's.

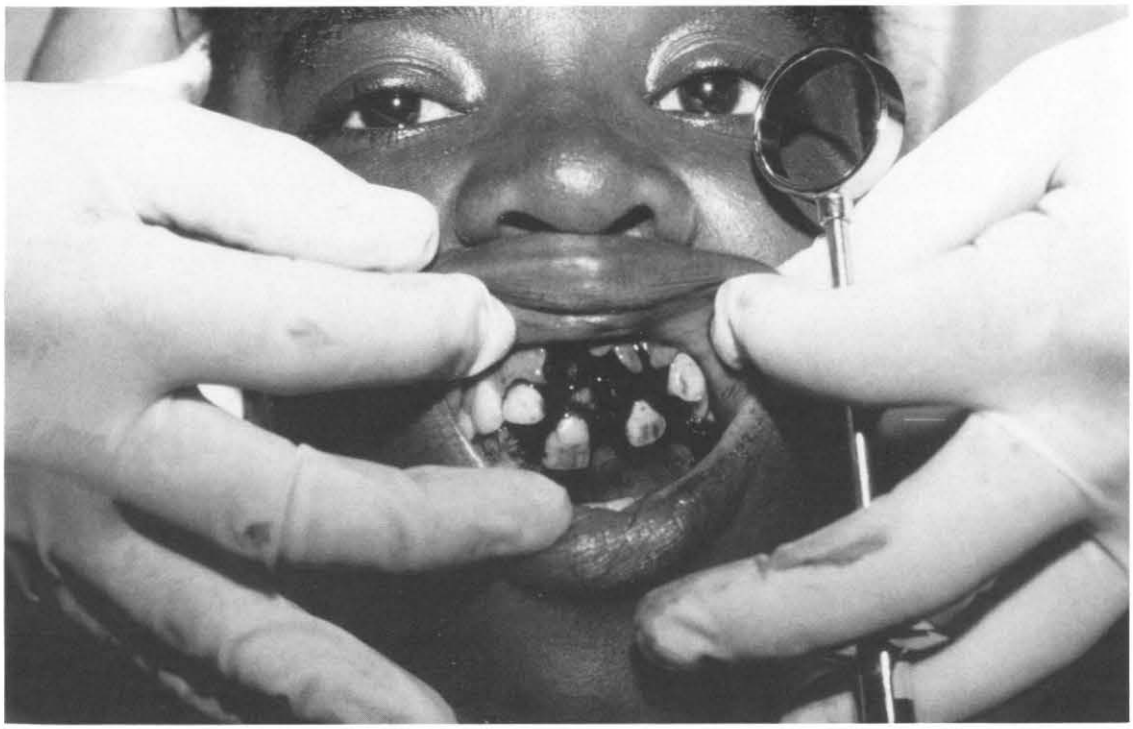
A 20 by 15 feet classroom was designated as the dental treatment area. Clean with cement floors, shutters for ventilation, and fluorescent lights, the room proved large enough for three dental chair work areas. Another operatory was placed in the local medical clinic across the street from the school.

Ingenuity and an Extension Cord or Two

Before the Grenadines were an independent country, the island chain had been protectorate of the United Kingdom. On Carriacou, electricity is supplied at 220 volts as it is in England. The dental equipment transported to the island from the United States operates on 110 volts and would have been ruined had any of it been plugged into the nearest outlet.

LCDR John Berg, DT2 Grant Abbott, and DT2 Bart Sudderth spent several hours working with employees of the Carriacou electrical company running extra power lines to the schoolroom and setting up transformers to convert the 220 voltage to 110. In the end, the Canadian equipment and one of the U.S. dental compressors were hooked up to operate the three dental operatories in the schoolroom.

After each day's work, the dental gear was disinfected, and the schoolroom was converted into a berthing area using cots and sleeping bags.



A collision during a cricket match resulted in this fractured maxilla and avulsed tooth.

"Open Wide"

Soon the participants in JOTS '93 settled into a daily routine. There were always long lines of people waiting to see the American dentists. At 0700 DT2 Abbott and DT1 Valerie Powell handed out cards to people who wished to be treated. Although 15 cards for each dentists were distributed, they ended up seeing between 18 and 25 patients daily. Because so many people wanted dental care those who were not fortunate enough to receive a card were advised to see if the doctors could work them in to the office by day's end. Usually there was a line waiting for appointment cards by 0515!

We were all touched by children waiting with their mothers for hours on end through the heat of the day in the hope of getting dental treatment.

Most 2-week exercises involve treating dental patients who are on active duty or are attached to the Reserve forces. JOTS '93 was unique for the types of patients seen and the procedures performed. Almost all patients were citizens of the Grenadine Islands. Of these, roughly one-third of our patients were children.

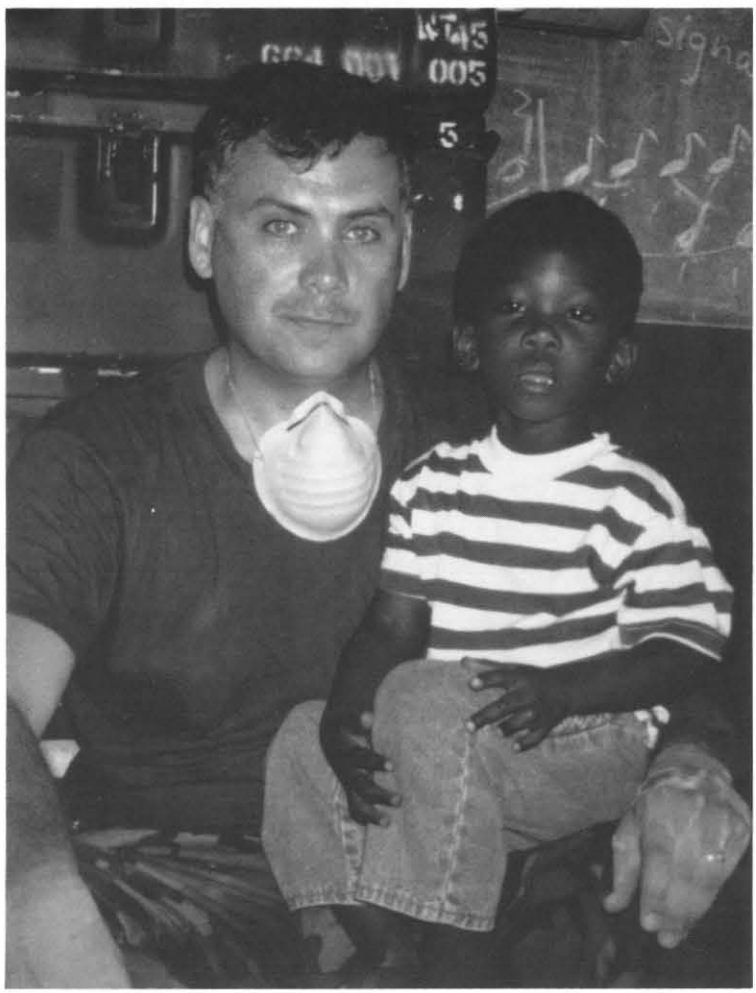
Water for most of the island's residents comes from rain and is stored in cisterns next to the house. With no fluoride available to the residents of the island, dental decay proved to be a real problem. Additionally, many mothers did not understand the link between sugary liquids and nursing bottle caries. Because of these factors, our group treated large numbers of carious primary teeth and saw scores of children with end-stage rampant decay.

In an attempt to explain the link between dental health and diet, DTCS Jill Fernandez, an instructor in the pediatric dentistry department at the New York University College of Dentistry, gave instructional lectures to children and schoolteachers on Carriacou and on the island of Petit Martinque.

During our stay on the island, one incident in particular proved how well members of the exercise had learned to work together. At approximately 1530 on a Wednesday afternoon a 14-year-old schoolgirl collided with a classmate during a game of cricket. The collision resulted in a compound fracture of the anterior maxilla and the avulsion of a front tooth. The girl was immediately brought to the dental clinic at the Middle School. After the bleeding was controlled and the fracture reduced, Dr. Berg performed root canal therapy on the avulsed tooth to prepare it for reimplantation. While the girl received care, Carriacou's physician arranged for her transfer to the government hospital on Grenada. In just 90 minutes from the time of the injury, the student had been treated and was on a commercial flight to Grenada for definitive care.

Lisa Hamlet, a Jamaican-trained dental Nurse, volunteered time and talent during the JOTS '93 exercise. In addition to treating pediatric patients under supervision of the Navy dental officers, she provided valuable insight into the lives of the residents of Carriacou. Her ability to calm

LCDR John Berg takes an X-ray as part of root canal therapy. Below: The author with one of his patients.



scared children and encourage apprehensive patients greatly improved the practice environment.

JOTS '93 proved to be an outstanding training exercise for all involved. A four-chair dental facility was established in an austere third world environment with limited support. Reserve dental officers and dental technicians on Carriacou provided surgical and pediatric services in addition to fillings and cleanings for island residents. Root canal therapy, denture repair, instructions for home fluoride use and even house calls to shut-in patients were also provided by the naval dental clinic personnel.

In addition to excellent training opportunities, the residents of Carriacou experienced the benefit of state-of-the-art dental care. The goodwill created by such an exercise improves the United States' reputation in the area served and throughout the world. ❑

—Story by LCDR Douglas Wright, USNR.

How to Close a Naval Hospital

It's no privilege to make the BRAC (Base Realignment and Closure) list. Ask any employee of a military base or hospital slated for closing or realignment. The potential loss of careers and livelihoods, the possible uprooting of families, and the vacuum created by termination of military medical care in a major metropolitan region can be catastrophic. Naval Hospital Long Beach, CA, is no exception. Built in 1967 as a 350-bed "midsized" facility, it will close its doors forever on 31 March 1994.

Although rumors had been circulating for some time that Long Beach was a target for closure, rumors became reality in October 1991 when Congress and President Bush approved DOD's recommendations and the closure process began. The BRAC process normally allows a base 5 years to close, but Long Beach's planners soon learned that since their budget had been cut significantly, operations would cease in 1994, 2 years earlier than expected.

There were few models for Long Beach to follow. In the Philippines, the United States and the host government had agreed to close the Subic Bay Naval Base with an even shorter timetable. But unlike Long Beach, Subic was not obligated to leave some form of medical care system behind. For all practical purposes, the United States presence in the Philippines had ended. Because the Long Beach Naval Shipyard will continue to operate, a nearby medical clinic at the Naval Station in Terminal Island would have to be upgraded to carry the increased load. Add the problems of critical care for active duty, and dependent and retired care for those beneficiaries who would remain in the Greater Los Angeles area. And thus, Long Beach became a pioneer.

Closure Plan

Once the dust had settled, Long Beach got right to work. CAPT Fred Jackson, MC, then commanding officer, charged his staff with both crafting and executing a closure plan. What issues had to be addressed at the outset? When you close a Navy hospital, what happens to staff, patients, the physical plant, and equipment? The hospital established a Base Closure Division as part of its Health Care Operations Department which would coordinate all closure activities. It also restructured its executive steering committee under TQL (total quality leadership), a process already in place. However, TQL changed its focus from normal operation of the hospital to a closure mode.

During brainstorming sessions, the executive steering committee came up with several hundred items of concern. After grouping them under separate headings, it formed six teams. These teams would deal with issues involving facilities, military personnel, civilian personnel, patient care, equipment, and administration and operational issues.

Once these categories were established, the next chore was manning the teams. It was evident that no one person could address all facilities issues, nor could one individual have all the answers for personnel matters. The executive steering committee selected team members who had a working knowledge of specific areas. Although the team members were mostly in-house people, some outsiders were tapped. Because the disposal of equipment was a major concern, an employee from DRMO (Defense Reutilization Marketing Office) became a member of that team. Also, when the civilian team was formed, both the union and EEO were included. To keep them manageable, the executive steering committee lim-

ited team size to 10 or fewer people. The teams came to be known as quality management boards (QMBs).

In keeping with the broad outlines of TQL, CAPT Jackson gave the newly appointed executive steering committee broad latitude. He also empowered the QMB leaders and members. They would not have to report to him or to the executive steering committee for approval of every detail of their plan. He merely wanted good communication to prevail and to be kept informed of progress. The only decisions he reserved for himself and the executive steering committee were those regarding policy where higher authority approval was required.

Although the Long Beach situation was not totally analogous to Subic, Long Beach benefitted from the Subic experience. LT Ed Salenga, a member of that closure team, transferred to Long Beach and shared lessons learned, particularly in the areas of equipment and facilities. Once the word of Long Beach's closure spread, the staff was bombarded with phone calls from all over the world requesting items, such as a new CAT scanner and recently modernized X-ray equipment. LT Salenga, citing his own experience, suggested that the San Diego HSO (Healthcare Support Office), an organization with a global perspective, become the "middle man" and coordinate the time-consuming equipment disposal activity for major medical equipment items.

Executing the Plan

As head of Health Care Operations, CDR James Banks, NC, keeps tabs on the total picture. His biggest role is to monitor what teams are doing and ensure that one isn't obstructing another. He points to the master chart on the wall of his office which provides an instant update. "We can take an action item, put it up on the wall, and see how that will impact what one of the other QMBs is doing. If we see a potential conflict, we get those two teams together."

As the major player in the closure plan, the executive steering committee meets for 2 hours every other week. QMBs may present problems and solutions and then, if required, the executive steering committee decides a proper course of action. Health Care Operations then assembles the QMB leaders, bringing them up to date on executive steering committee decisions. "Then we go around the room," explains CDR Banks, "and say, 'Team leader from Facilities. What are you working on? What do you need from Civilian Personnel or Equipment?'" In this way, miscommunication is minimized and the process proceeds.

Because there will be a continuing Navy presence in Long Beach after the hospital closes, an outpatient clinic at the Naval Station will continue to operate but will not provide such specialties as orthopedics, urology, and ENT. However, family practice, internal medicine, optometry, social work, occupational health services, military sick call, and limited laboratory and radiology will be offered. Memoranda of understanding have been established with local medical facilities, provider groups, and diagnostic services to provide specialty care not available at the Naval Medical Clinic.

One of the key services the clinic will provide is pharmacy support. Currently, the hospital pharmacy fills an average of 23,000 outpatient prescriptions a month. Sixty-five percent of those come from beneficiaries such as retired military who see civilian doctors and have their prescriptions filled at the hospital pharmacy. A new 3,800-square-foot pharmacy has been established in the Navy Exchange near the clinic which will take over the responsibilities of the current hospital facility. It opened on 4 Jan.

Filling the Vacuum

The fully functioning general outpatient clinic will help take up some of the slack once the hospital closes, but there are still the dual problems of active duty and beneficiary inpatient and specialty care. The Naval Hospital Long Beach closure process solved these problems with somewhat different solutions, based on utilizing nearby medical facilities in a managed care network. At the time the hospital learned it was slated for closure, it had 163,000 beneficiaries. Where would the patients go? Naval Hospital San Diego is 102 miles away, and Naval Hospital Camp Pendleton is at least an hour and half drive down Interstate-5.

According to CDR Banks, the solution is literally in their back yard. There are close to 40 medical facilities between Long Beach and Camp Pendleton already under the CHAMPUS reform initiative for dependent care, and which have agreed to handle Long Beach's former dependent load. Active duty care could also be handled in local medical facilities. Naval Hospital Long Beach found that area bed occupancy rates were between 40 and 55 percent. Thus, the Navy could get specialty care in local hospitals and get it at bargain rates. "When we put the word out that we were looking for active duty beds, the phones began ringing off the hook," points out CDR Banks, "and they are quoting us bed rates that are under CHAMPUS allowable rates." For routine care such as an appendectomy or a broken limb, the active duty member can be treated at a local hospital and the procedure paid for with supplemental funds already in the budget. If extended hospitalization or a medical board is required, the member will be sent to San Diego or Camp Pendleton.

The People

One of the major concerns in any facility closure is people. Naval Hospital Long Beach once had about 1,100 employees, many of them civilians who had been with the hospital for many years. Their needs would have to be met in the closure plan. Happily, a few employees who qualified will be filling billets at the clinic. But what about the others? Says Cynthia Rhodes, management analyst in Health Care Operations, "It was the CO's policy right from the beginning to keep the civilian staff fully informed of exactly what was happening and how they would be affected." To aid communications, the hospital began publishing a bimonthly base closure newsletter which goes out to all staff members by name. Scattered throughout the hospital are concern boxes in which employees or beneficiaries may deposit questions or concerns. Health Care Operations reviews these concerns and then forwards them to the QMB team leader who can best address the issue. Each employee or beneficiary then gets a personal written or telephonic reply. "Our main concern has been and will continue to be communication up and down the line, from our employees to all our retirees in the area," stresses CDR Banks. "At least two weekends a month, someone on this staff is involved in some kind of brief either to a retiree organization or a military organization not only on the closure process but what we're doing as far as care once we go away."

Closure also translates into jobless civilians. Trying to place as many of them as possible became a key concern of the civilian personnel QMB. By holding on-site job fairs, over 75 employees found jobs with other federal employers such as Camp Pendleton, Naval Hospital San Diego, the Immigration and Naturalization Service, the Veterans Administration, and the Air Force Academy,

Photos by the Editor

to name a few. The employees are also eligible for priority placement programs available through DOD.

Taking advantage of grants through the Department of Labor's Job Training Program Act, the Long Beach Private Industry Council contracted with California State University, Long Beach to staff an office within the hospital to provide counseling, skills testing, and assistance with resume and job application preparation. The contractor also runs a free 5-week computer course, and stress and financial management classes. There is also assistance with interviews for jobs in the private sector.

Solving the military side of the equation was a bit easier, even though it meant scheduling Permanent Change of Station (PCS) moves for up to 600 people. The hospital's innovative solution was to invite detailers from the Bureau of Personnel (BUPERS) to Long Beach to meet military staff members face to face. The hospital paid for the enlisted detailers to come; they were able to work the officers into an already scheduled detailers visit. BUPERS agreed to allow spouses to sit in with the active duty members to aid in assignment decision making. "Most decisions were made on the spot, and when the detailers left, they had each person's name, where they were going, and orders were generated from there," says Cynthia Rhodes from Health Care Operations. "Everyone seemed fairly happy with the way it was done."

The Facility

Disposing of Naval Hospital Long Beach's land is no less complicated than the other issues the closure team had to face. The property originally belonged to the City of Long Beach. The main hospital occupies what is called Parcel A. The main housing units, heliport, filling station, and recreation facilities occupy Parcel B. The original agreement with the City stipulates that when the federal government no longer operates a hospital on Parcel A, Parcel B will revert to the City. Parcel A would then be offered to other federal agencies for reuse with other DOD activities getting first choice. If there were no takers within DOD, other federal agencies could then bid on the site.

DOD showed no interest, and two other federal agencies that did were not approved. As of this writing, disposition of Parcel A is still undecided. This phase of closure is not the direct responsibility of the hospital's closure team. The Department of the Navy makes the final decision on what happens to Parcel A, taking into consideration both the environmental and economic impact various reuse alternatives would generate. If the decision is not made prior to the hospital's closure on 31 March, a caretaker team from the Naval Facilities Engineering Command will move into the facility to provide security and maintenance oversight.

The Last Detail

Closing and decommissioning a naval hospital is anything but simple. Even after the hospital closure team has dealt with personnel, health care, equipment, administrative requirements, and facilities, one last detail requires attention—environmental issues. Before any transfer can take place, the Department of the Navy must rectify any environmental discrepancies. This has required asbestos and lead paint surveys, and seismic surveys, obviously critical for any California structure. The hospital's underground fuel storage tanks must be removed and the surrounding soil monitored for possible contamination. Fortunately, there has been no evidence of this.

By the end of March the well-planned and meticulously executed closure process will be complete and Naval Hospital Long Beach will cease to be. When a vessel that has served the nation with honor and distinction is decommissioned, there is usually a mixture of sadness and pride among her crew. So it is with a Navy health care facility that has served both the Navy and the community for 27 years. Long Beach is certainly not the first naval hospital to close nor will it be the last. What makes it unique is the way its crew has been empowered to create a model for how that painful process should be carried out.

CAPT Barbara Mencik, NC, Naval Hospital Long Beach's present commanding officer, sees her closure team's mission as accomplishing four important tasks. One is to close the hospital. Another is to provide the best medical care while doing that. The third is to get the clinic up and running. And the fourth is to write the book on closure. By 31 March, the staff of Naval Hospital Long Beach—the pioneers—will surely have written the manual.—JKH

The People Factor

Ms. Jean Milton is a civilian nursing assistant at Naval Hospital Long Beach and has been a Navy employee for 18 years, starting out at Naval Hospital San Diego, and transferring to Long Beach in 1982. With the closing of the hospital, Ms. Milton was subject to planned reductions in force (RIF). However, she applied for and was accepted for a clerical position in the new medical clinic at Terminal Island.

There had been rumors for some time that we were going to close, but nobody wanted to believe it. This was a very busy hospital at one time and I worked in the OB ward. We had four delivery rooms. But we delivered our last baby here in 1985. I never really dreamed that it was all going to end.

The command personnel office has been very helpful trying to get us jobs. I knew I couldn't stop working, with two children in college. I have a clerical background and was willing to get out of nursing and try something else. When I was at Balboa, we could go to special classes with the military and I did every chance I got and learned a lot about medical terminology. Dorothy Grubbs, the personnel officer here, reviewed my records and said I was qualified for medical clerk. It sounded good to me. I'm now in training in Medical Records and really like it. I'm also taking a course in computer science 3 days a week. I think I'm really going to enjoy working at the clinic when we finally move there. In my case it's a happy ending. I'm so grateful that I can finish up with the Navy.

HM2 Daphne Wrenn works in Utilization Review, part of Quality Assurance. Her duties with patient records revolve around in-patient care. She already knew about the hospital closing when she arrived for duty and, because she had planned to spend some time in the area, feared being transferred overseas. However, HM2 Wrenn also has been selected to serve at the new clinic.

I really hoped the hospital would stay open. Often when I'm in the elevator, retirees ask me when it's closing. They didn't want it to close. Some of them moved to Long Beach because there was a hospital. But at least, now, there will be a clinic.

There were some [enlisted] people who were upset because you make your plans to be somewhere so long and things change, but that's all part of Navy life too. When the detailers came here, the biggest complaint I heard was, "They only offered me this or this, or they only had one place for me to go." If you didn't want certain orders there was some room to maneuver, but you had to take orders right then and there. When a hospital is closing you have to take what's available.

Personnel requested people who wanted to go to Terminal Island to submit a special request chit and I did. Once they knew who was going they printed a newsletter and listed everyone who was going. I don't know exactly what my new duties will be at the clinic but I've worked quite a few places since I've been in the Navy. I'm flexible. This is what I really wanted. My family is here. I have two babies and my husband works for the police department in LA. If I went overseas it would have been a bit awkward, to say the least.—JKH

Assessment of the TQL Infrastructure in Navy Medicine

LT Jocelyn J. Johnson, MSC, USNR

This report provides background and methodology of a questionnaire assessing the status of Navy medicine in the implementation of total quality leadership (TQL). The last section discusses results and positive outcomes of TQL implementation, and responds to possible barriers impeding progress in this area.

The Executive Steering Council (ESC) for Navy medicine, headed by the Surgeon General, chartered a TQL Measurement Task Force to measure the progress of the Navy Medical Department in the implementation of TQL. The group decided that a preliminary objective was to assess the status of the TQL infrastructure, or the mechanisms by which TQL is organized in commands. The infrastructure is most often defined in terms of "structure," "policy," and "practice in everyday worklife."(*1*)

TQL structure in an organization refers to the establishment of a command ESC, identification of a TQL coordinator and TQL facilitators, and the formation of Process Action Teams (PATs). Each has specific functions and roles in relation to TQL implementation. TQL policy is reflected in the strategic plan, which includes the organization's vision and mission statements, guiding principles, and strategies and objectives for achieving its mission and realizing its vision. This cultural document assists organization members in being focused in a single direction, fosters commitment, provides alignment for the organization, and is an essential prerequisite for increased empowerment of the work force. Finally, TQL in daily worklife is the ongoing practice of the principles and methods of TQL by all organization members (e.g., attention and response to customer needs and expectations, continuous improvement of product and service, etc.).

The TQL Measurement Task Force developed a questionnaire to assess the status of TQL implementation in Navy medicine in terms of this infrastructure. Training needs, positive results experienced, and problems and concerns related to TQL implementation were also assessed.

Methodology

The TQL infrastructure questionnaire was mailed in July 1992 to 105 naval medical and dental treatment facilities, and "other" naval medical commands (e.g., Naval Medical Research Institute). The response rate was 76 percent, with a total of 80 out of 105 questionnaires returned for analysis.

Responses were analyzed by Naval Medical Quality Institute (NMQI) staff quantitatively by calculating frequencies and percentages for various items and descriptive statistics for others, and qualitatively by performing content analyses for open-ended questions. Results were provided at the annual Commanding Officers' Conference in October 1992.

After completion of the initial analysis, four questionnaires were returned late, and eight were received after a second mailing, increasing the response rate to 88 percent. An overall analysis of the 12 additional questionnaires revealed that responses did not significantly alter initial questionnaire results.

A total of 70 items comprised the questionnaire. Items assessed information about ESCs, Quality Management Boards (QMBs), TQL coordinators and facilitators, and PATs (e.g., training received, frequency of meetings, focus of processes improvement areas), as well as total work force training and participation in TQL, the development and dissemination of command strategic plans, and the collection and use of data for quality improvement purposes (e.g., to identify and meet customer needs and expectations, to understand and improve processes, etc.). Finally, open-ended items asked respondents to list additional training needs, positive outcomes of TQL, and problems or impediments related to TQL implementation.

Results and Discussion

Results indicate that the "structure" aspect of the TQL infrastructure is essentially in place in Navy medicine. That is, the majority of commands have established an ESC, employ TQL coordinators and facilitators, and have chartered PATs.

The "policy" and "practice of TQL

in everyday worklife" aspects of TQL infrastructure are in early stages of evolution. For example, in relation to policy, although the majority of commands (> 80 percent) have completed, or are in the process of formulating a strategic plan, responses suggest a need for additional training in this area. After strategic plans have been developed and disseminated, commands must operationalize specific methods for meeting organizational goals and objectives, and then intermittently assess progress in meeting them. Periodic updating of the plan is also required based on a consideration of the status of each command in relation to the overall mission and vision of Navy medicine, as well as attention to external political, economic, and sociological conditions. Meeting objectives with diminishing resources may be initially difficult, but the task becomes easier as organizational efficiency and effectiveness are augmented as a result of TQL implementation.

Regarding the practice of TQL in everyday worklife, questionnaire results denote that more of the total work force needs to be actively involved in implementing TQL. Results also demonstrate that all levels of staff need more training, and that approximately 20 percent of commands who have chartered PATs do not reward and/or recognize their efforts. In order for TQL to become an integral practice in everyday worklife, training is required for all organization members, as well as top leadership fostering and nurturing a culture conducive to the TQL philosophy. Total involvement of the work force in TQL will be accomplished by commandwide recognition and positive reinforcement of quality initiatives. Of course, it is still early in the journey, and it is expected that the latter two aspects of TQL infrastructure will take time to evolve and permeate the organization.

The most frequent positive outcomes of TQL implementation reported by respondents are increased access to services by customers, enhanced communication, and improved work and patient satisfaction. These results are feasible and likely outcomes of TQL implementation, as research indicates. For example, research shows that quality and patient satisfaction are highly correlated.(*2,3*) In addition, substantial evidence exists that employees who have an opportunity to participate in job-related decisions report more job satisfaction than those who do not.(*4*)

Positive outcomes of total quality implementation in health care are becoming increasingly apparent. These include cost-avoidance and cost-savings, decreased error and rework, enhanced communication among departments, time savings, and increased efficiency.(*5,6,7*) Examples reported by various medical treatment facilities in Navy medicine include decreased time for staff check-in/out procedures, more efficient admission and discharge procedures for patients, and substantial reduction of interest payments incurred due to overdue bills. Though positive results based on objective data are being reported by commands, a concise methodology which assesses cost and other benefits of quality interventions is required, and a central data base maintaining documentation of these outcomes is needed.

Additional training, lack of continuity due to personnel turnover, and needs for TQL information-sharing among commands are the three most frequent responses listed as impediments to successful TQL implementation. In response to the training issue, the frequency of current TQL courses offered by NMQI has increased, and new courses are in the process of development.

Navy medicine uses a consistent TQL infrastructure, language, and process improvement methodology. As more individuals become trained and experienced in this standard approach, these skills will transfer to ongoing TQL efforts in different commands, thereby ameliorating the turnover issue. However, top management might reconsider the necessity for, and the value of policies currently in place requiring medical personnel reassignment every 3 years.

An automated TQL bulletin board is operational, and a TQL newsletter is being developed by NMQI staff. Moreover, an annual TQL coordinators' conference is being considered as a means to enhance communication among naval medical activities.

Navy Medical Department questionnaire results are comparable to those obtained by the General Accounting Office (GAO) in their survey of over 2,000 civilian and DOD installations, providing evidence for cross-validity of the measures. Like the purpose of the TQL infrastructure questionnaire, the objective of the GAO survey was to "obtain information on the status and scope of TQM (total quality management) implementation in the federal government, the barriers to implementation, and the benefits being realized through the adoption of TQM practices."(*8*) The average age of TQM in federal installations at the time of their study was 2 years, like that of TQL in Navy medicine.

Out of the 68 percent of federal installations reporting TQM activity, the majority are in early stages of maturity (most frequently, "just getting started" and "implementation," two stages prior to "achieving results" and "institutionalization"). Moreover, survey results indicate that

the structure of TQM (i.e., existence of Quality Councils and Quality Improvement Teams) is generally in place, yet more employee involvement and recognition and reward for total quality efforts is required. These results parallel those for TQL implementation in Navy medicine.

The most frequent barriers reported by GAO survey respondents are that employees do not believe they are empowered, funding/budget constraints, lack of training in tools and concepts, and resistance to participatory management, concerns expressed by employees in Navy medical activities. Interestingly, the GAO survey found that as installations report being further along in implementing TQM, they indicate fewer barriers and more employee involvement. In addition, reported benefits (e.g., productivity, quality, timeliness, cost reduction, customer satisfaction) increase as organizations progress further in TQM.

An established TQL structure enhances intra- and inter-departmental communication within organizations, an initial positive consequence of TQL implementation. However, a secured structure does not guarantee desired outcomes such as improved service to customers, increased employee morale, and cost-savings, etc. Various characteristics indicative of a TQL culture must exist in order for TQL to be successful.

For example, leaders must demonstrate model behaviors which foster the movement toward a TQL culture in Navy medicine. These behaviors include initiating contact with employees about job- and quality-related issues, providing adequate resources to make significant improvements in quality, and rewarding individuals who exhibit the courage, caring, and initiative to ultimately affect positive change. Other significant elements which facilitate a TQL culture include employee training in the philosophy and methodology of TQL, opportunity for employee participation in decision-making, emphasis on teamwork, attention to customer needs and requirements, and data analysis for quality improvement purposes. This culture is assessed by surveying employees' perceptions of the extent to which these elements are integrated into the work environment. Based on analysis of survey data, recommendations for interventions to accelerate the movement toward this culture are then provided to management.

Newspaper articles discuss the demise of quality management in organizations because of the length of time required to find causes of problems in processes, and to implement improvements and assess their effectiveness. These views are not surprising considering that Western leadership has been reinforced for a reactionary management style and a focus on quick results.

An analogy might be made between the "ailing" patient and the "ailing" organization. It is ironic that we recognize the salience of proactive health measures, and the importance of research into the etiology, diagnosis, and treatment of physical and mental disorders, and that these aspects of health care are resource-consuming, yet we are not so proactive and persevering in the management of the health care organization itself. Time is also needed to diagnose and treat the ailing organization, and to achieve positive outcomes.

It has also been suggested that TQL is another management fad. In response to this contention, TQL is not so new and revolutionary in that many of its principles are derived from, and have been researched and supported in the fields of industrial psychology, organization development, and management science. Moreover, TQL uses a quasi-scientific methodology; hypotheses are formulated about the causes of variation, or problems in processes, and these hunches are tested (supported or rejected) based on objective data analysis. The effectiveness of interventions that reduce variation and eliminate the cause or causes of organization problems (and not just treat symptoms of core problems) is also assessed by analysis of objective data.

Directions for the future of TQL in Navy medicine include increased training and consultation services to Navy medical activities. Support will be provided in the areas of strategic planning, data collection and analysis for quality improvement purposes, and tools for implementing the principles and methodology of TQL.

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Health Psychology in the Navy:
Emergence of a New Discipline

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Within the field of psychology a rapidly developing subspecialty known as health psychology has gained increasing attention over the past two decades. This subspecialty has developed due to a growing interest among psychologists to use psychological and behavioral interventions to address effectively medical and health concerns. Interest in this area was heightened in part due to a paper published by Schofield(*1*) addressing the need for psychologists to address health problems in settings other than mental health clinics. This resulted in the appointment of a Task Force on Health Research by the American Psychological Association, and has been described as "the launching of health psychology as a recognized component of the discipline of psychology.(*2*) Today, the American Psychological Association has a Division of Health Psychology (Division 38), and a journal, *Health Psychology* devoted to this growing specialty area.

In terms of formal definition, health psychology has been described as "the aggregate of the specific educational, scientific and professional contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, the identification of etiologic and diagnostic correlates of health, illness and related dysfunctions, and to the analysis and improvement of the health care system and health policy formation."(*3*) Health psychology is also foundational to the field of "behavioral medicine," an interdisciplinary specialty concerned with "the development and integration of behavioral and biomedical science knowledge and techniques relevant to health and illness."(*4*) Within the Navy, the practice of health psychology has historically been represented in the field of "medical psychology," which has been broadly defined as "the study of psychological factors related to any and all aspects of physical health, illness, and its treatment at the individual, groups and systems level."(*5*) Whatever the term used, clinical health psychologists, simply put, use psychological and behavioral techniques to help people to cope effectively with existing medical conditions, increase health promoting behaviors, and reduce health-related risk factors.

Health Psychology in the Navy

As health psychology has developed as a professional subspecialty, so has it flourished within the Navy. Currently, each of the three training sites for psychology interns—Portsmouth, San Diego, and Bethesda—have a Division of Health Psychology run by postdoctorally trained specialists. The fact that all three internship sites require interns to complete a 3-month rotation in health psychology underscores its recognized value to Navy medicine.

Clinical health psychologists in the Navy offer a broad range of psychological services to evaluate, treat, and prevent a variety of health and medical conditions such as gastrointestinal problems (e.g., irritable bowel syndrome, GERD), oncology patients, chronic headaches, dental disorders (e.g., TMJ disorder, bruxism), adjustment to chronic illness, cardiovascular problems (e.g., hypertension, cardiac rehabilitation), problems with medical compliance, and a variety of medical and nonmedically-related anxiety conditions. In addition, clinical health psychologists intervene in many health promotion and risk-reduction programs including weight management, smoking cessation, and stress management. This last area is of particular importance in that up to 80 percent of today's health problems may be linked to stress.(*6*) By offering treatment and training in such areas as these, health psychologists are functioning in direct support of BUMED Instruction 6110.13 and Navy Medical Department Strategic Goal No. 4.

In Navy medical centers, one area health psychologists are increasingly involved in is the area of chronic pain, including disorders such as headaches, myofascial pain, reflex sympathetic dystrophy, neuropathic pain, and pelvic pain, to name but a few. Consider, for example, this case.

A 38-year-old chief petty officer with approximately 20 years active

HM3 Jennifer Zearbaugh conducts biofeedback with a "patient."

service presented with a history of chronic pain postthoracic surgery for a benign tumor. He complained of difficulties sleeping and working due to chronic pain. He was diagnosed as depressed and evidenced significant functional (occupational, social, and recreational) impairment. Anesthesiology referred him to health psychology. Other referrals initiated included physical therapy, cardiology, and psychiatry for management of antidepressants. He was placed on limited duty and began a pain management program of aerobic exercise, calisthenics, relaxation and biofeedback training, marital counseling, and cognitive-behavioral therapy. Initially he was unable to walk for more than a few minutes per day, perform routine work tasks, or engage in social activities. At the conclusion of treatment he was able to walk an hour per day, perform well at his job, and carry out rewarding social activities with friends and family. His depression and physical complaints resolved, he returned to full duty.

As is evident in this example, health psychology works to integrate its services within a interdisciplinary framework involving a variety of appropriate medical services. Specific interventions used by health psychologists are quite varied, and these professionals choose them because of their proven efficacy with a particular problem. These range from more traditional techniques involving behavior therapy, individual, group and marital-family therapy, to more specialized interventions utilizing procedures such as biofeedback or hypnosis. Requests for biofeedback seem to have particularly increased. This "high tech" approach to treatment involves attaching sensors to the patient which provide vivid computer generated biological feedback regarding a particular psychophysiological domain relevant to the patient's problem. For example, frontalis muscle tension may be measured and displayed to a patient with chronic muscle tension headaches. Finger temperature may be monitored as a measure of peripheral blood flow for a patient with hypertension or Raynaud's disease. Or skin conductance levels may be monitored as a measure of autonomic arousal or anxiety, to name but a few. Patients properly guided in the use of biofeedback are generally amazed to discover how effectively they can learn self-regulation skills to control physiological activities which they had assumed were beyond their control (e.g., blood pressure, pulse, muscle tension, respiration, vasodilation). They are usually impressed with the effect this has upon reducing or eliminating their symptoms.

Figure 1 illustrates an example of dual modality biofeedback training in which psychophysiological feedback is provided via surface EMG feedback (often used as a measure of muscle tension), and surface finger temperature (used as a measure of peripheral blood flow). In this example, the subject has used biofeedback to learn how to reduce specific muscle activity while increasing peripheral vasodilation, skills found to be effective in the management of a variety of psychophysiological disorders.

Along with direct patient care, health psychologists in the Navy are consultants at the "systems" level to facilitate organizational health, and to provide assistance to other health care professionals who are often under tremendous pressure. In providing these services, the goal is often to identify and minimize factors creating or maintaining unhealthy levels of staff stress and thus reduce the risk of burnout. Health psychologists are also more frequently becoming faculty in medical education programs in and out of the military.

In addition to expanding psychology's role in a hospital-based practice, there are active efforts to bring health psychology to the fleet. One way of achieving this is through stress management workshops offered on board ships. Also, with the move toward "smoke-free" ships, there are more requests for assistance in developing smoking cessation programs.

In addition, techniques such as biofeedback and stress inoculation have been found to be helpful to people in highly stressful operational occupa-

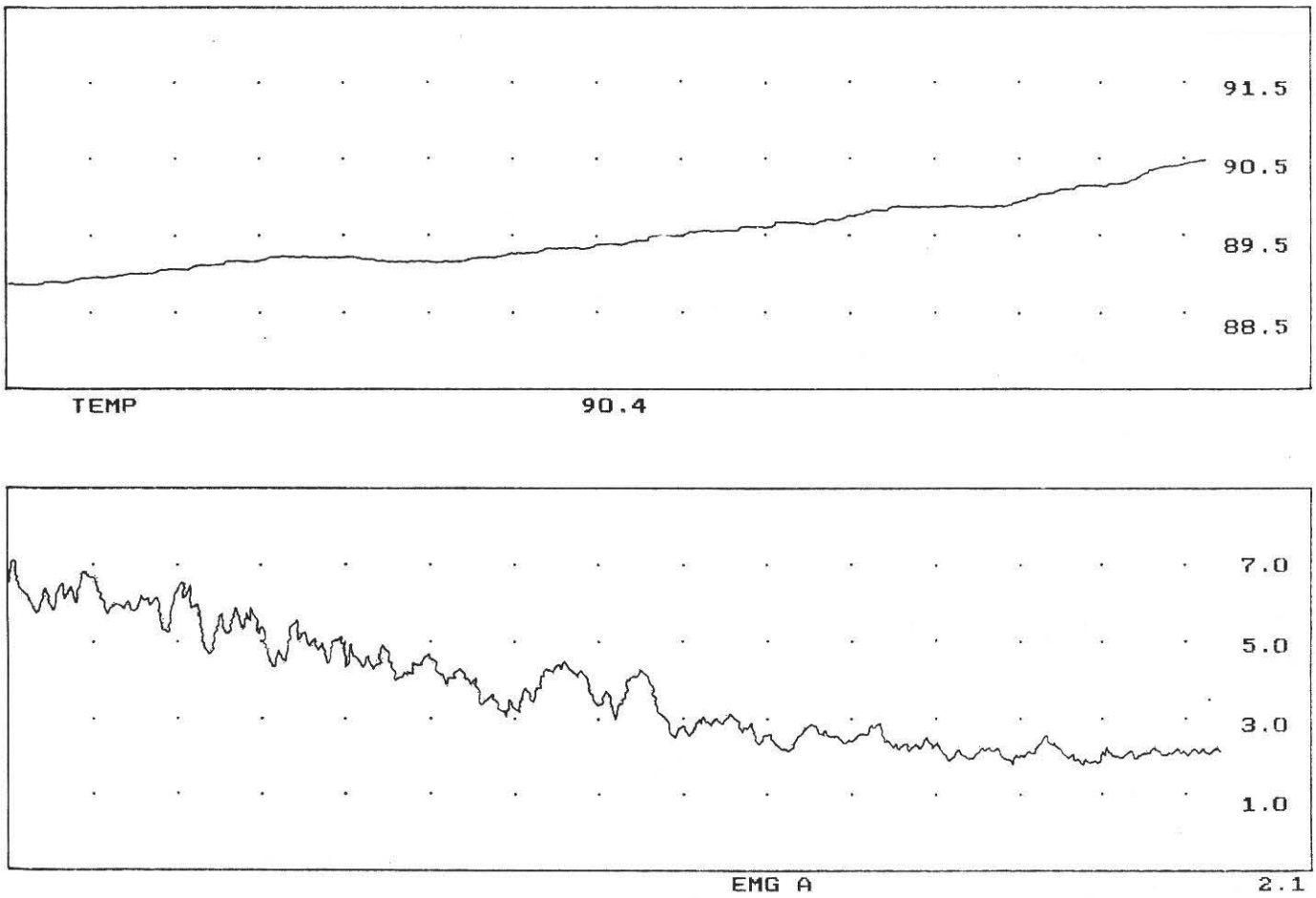

Figure 1

tions. Increased opportunities to take health psychology to local commands and the fleet are only likely to increase with the growing emphasis upon health promotion programs within the Navy, in accordance with OPNAV Instruction 6100.2.

Finally, as we look to drastically cutting military health care costs, health psychology offers interventions that can help save dollars. For example, recent estimates indicate that group treatment of chronic pain patients can result in significant savings to the health care system.(*7*) Self-management programs such as those provided by health psychologists have also been shown to cut costs while decreasing medical utilization.(*8*).

In summary, Navy health psychology is a rapidly growing subspecialty of Navy psychology working to address medical and health concerns for Navy personnel and their families. Working alongside other health care professionals, psychologists in this field work in Navy medical facilities to help patients cope with and manage a range of medical problems. They also work to bring effective health promotion programs to the fleet to help personnel develop healthy lifestyles and effectively adapt to intense occupational stressors (an increasingly important task during this period of downsizing). Hopefully these contributions will not only offer improved quality of life in the present, but dividends for the future.

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A Conversation With the Surgeon General

Recently, Navy Medicine *met with VADM Donald F. Hagen, Surgeon General of the Navy to discuss a wide range of issues and challenges currently facing the Navy Medical Department.*

Navy Medicine: For over a year the Navy has been promoting its new policy called "From the Sea," a philosophy that will govern the Navy's mission as we enter the 21st century. What is Navy medicine's role in this philosophy?

VADM Hagen: For us in Navy medicine, "From the Sea" is what we're all about. We have been practicing amphibious warfare medicine since Navy medicine began, and have had plenty of practice working with the Marines and the Seabees. Our job has always been treating casualties on the beaches and during the insertion of troops. The exciting aspect of "From the Sea" is that it not only incorporates the Navy medicine link with the Marine Corps but now, as demonstrated in Somalia, it also shows how we are closely cooperating with the Army and Air Force.

Since operational medicine is one of our chief roles in supporting the fleet and the Marine Corps, do you have any thoughts on our recent deployments to Somalia and the Adriatic?

In the Somalia operation, I was initially concerned with the possibility of significant casualties. But the Task Force Surgeon, CAPT Mike Cowan, was experienced and did an exceptional job planning for the operation. As it turned out, all went very well, but we were ready. Our biggest success in Somalia was in the area of disease prevention. The lessons we learned from Desert Storm about preventing disease were put to good use in Somalia. We taught our people about endemic disease, how to protect their drinking water, and what not to eat. Once again we confirmed that we can go almost anywhere and prevent illness.

In Zagreb, [Croatia] the Army was tasked first to set up a field hospital to support UN Protection Forces. They had the responsibility for about a year after which the Air Force relieved them. And this spring it will be our turn. The prospective CO and logistics people have already visited the hospital in Zagreb. We have pictures, we have interviewed people, we know what our problems will be and are preparing to meet them. The mission has recently expanded to include treatment of severely wounded children. We are excited about going and are ready to take on this new mission.

There are a lot of issues connected with shrinking defense budgets. What are we doing to increase efficiency in these tough times?

Despite the drawdown in forces, Navy medicine's plate is full. To stretch our limited dollars further, we are doing a number of interesting things to control costs. Probably the greatest long range impact will be achieved by the use of the prime ven-

dor concept for the acquisition of pharmaceuticals and supplies. This is a major technological leap forward in requisition and procurement of pharmaceuticals. We have eliminated a major amount of bureaucratic paperwork by going to a computerized system. The saving here will be significant. There will be more savings once this program expands to include the acquisition of medical and surgical supplies. I think it's also important to realize that our inventories will diminish because we will buy what we need when we need it.

How are the new budget realities affecting the quality of health care? How are we going to take care of people with fewer resources?

We are going to have to change the way we do business. We need to focus more on ambulatory care, embrace the health care reform package, and increase vertical integration and product line service. By focusing on ambulatory care we can provide care at a reduced cost. NMC San Diego is a good example of product line service. They have started looking closely at the functions of certain work centers in the hospital. A charge nurse on the surgical ward may also be the charge nurse for the surgical clinic, thus creating a product line link between the surgical clinic and the surgical ward, thereby facilitating communications. Vertical integration assigns patients to case managers, who follow the surgical patient from the home to the clinic to the operating room and back again. Case managers help to avoid costly, unnecessary inpatient and clinic visits. It streamlines the system.

It's going to be difficult for us to live with these funding constraints and deal with the forces that are trying to reduce the numbers of people in Navy medicine. But I think we can do it because we have the best group of talented people in our history to deal with the challenge.

How will operational medicine be affected?

During the Cold War, I gave the first briefing at the Pentagon on the requirement for fleet hospitals. Even though we couldn't afford what we would have needed for a major all-out war, we bought a significant number of high-tech, very fine fleet hospitals. Times and circumstances have changed, and now I feel that we need to be more flexible. We need to have smaller more flexible units. Although we are not reducing the size of the existing 500-bed and 250-bed hospitals, we have developed 100-bed equipment sets from existing equipment inventories and have pre-positioned these on each coast. We can use the same people with the same training and leadership designed for the full-sized fleet hospitals to staff a smaller, more flexible hospital. Currently, we are training one of those teams to work in the United Nations hospital in Zagreb.

One of the biggest things we have been working on is telemedicine. So often young medical officers are out at sea and a crisis occurs. They would really like to be able to communicate with a specialist ashore. The Navy already has the right kinds of communications capabilities for us to piggyback on that will enable us to do interactive communication with our shore-based hospitals. A good example is interactive video telecommunications of radiology images. A surgical team on an amphibious ship might like to have the advice of a neurosurgeon at Bethesda or San Diego. They should be able to send a digital image of a skull X-ray to Bethesda, where the neurosurgeon can give advice. It would be like having the neurosurgeon right there looking over your shoulder.

Photos by HM2 Robert D. Finnemore, NSHS, Bethesda, MD.

We're also working on the digital imaging capability to send pathology specimen pictures and color slides through this system to AFIP [Armed Forces Institute of Pathology] so that their pathologist can evaluate them. In fact, we are testing it right now at our hospital in Memphis, and it is working exceptionally well.

How does Navy medicine fit into the larger picture of health care reform?

Early on, the President asked the Secretary of Defense to help with health care reform. Therefore, we have provided the White House Task Force with information on Navy medicine. What we've seen of the President's program looks similar to the triple level system we already have in California and with TRICARE in (Tidewater) Norfolk, VA. The first option is a HMO; it is our least cost option. With the HMO the patient is going to the same primary care provider or same primary care institution. Secondly, if people desire more

flexibility, we have a preferred provider option. The Tidewater and Charleston programs are good examples. Patients get care in the civilian community through a preferred provider, who charges reduced rates through CHAMPUS. Patients pay less, we pay less, we do the paperwork, and the patient gets to see their preferred provider. It's a little more money than going to a HMO, but it's not as expensive as the patients going through standard CHAMPUS. The third option is the fee-for-service, the standard CHAMPUS option. Here the patient has full flexibility to choose their own doctor but they have to pay more for it.

What other initiatives in managed care does the Medical Department have?

We have been involved in CHAMPUS reform in California and Hawaii from its beginning, and the CAMCHAS program in Charleston is another tremendous example of Navy success in managed care. Prior to putting in our catchment area management program in Charleston, we had a lot of patient dissatisfaction. They couldn't get in the system. After we got things together with a preferred provider organization, things really changed for the better.

What's going on with Graduate Medical Education at the moment?

Two years ago we recognized that we had to realign some GME programs. We had to streamline some programs and eliminate residencies in some areas. Last fall all three services met together for the first time to select their interns and residents. It was a tremendous success. We placed over 40 physicians in other service programs. We do not exist for GME but GME is a very, very essential part of Navy medicine. It is the primary way we attract and retain quality people.

We already have a goal of eliminating tobacco from the fleet. What are some of our other initiatives in health promotion?

Tobacco is the primary issue for us in prevention. It is the number one problem driving up health care costs in this country. But in getting the word out to the fleet, the fleet commanders have also picked up on the business of physical fitness and wellness. I was just aboard several ships in San Diego. I saw weight rooms, dietary initiatives, and healthy food selections for the sailors. It is gratifying to see more and more commanding officers becoming personally involved in the wellness issue. However, we still have to keep looking at our injury rates and our alcohol-related injuries. These are still too high and costly for both the Navy and Marine Corps. We must take on the alcohol issue. Stress reduction is another one, and I could go on and on. Suffice it to say, there are a lot of wellness initiatives in the package for a "Healthy Force 2000."

What is the status of the Total Quality Leadership program?

If you've seen a change at BUMED or in other areas of Navy medicine, you've seen TQL in action. The reductions we face at headquarters, in the hospitals, and with base closures could never have been tackled unless the people had changed their approach to doing business. And they have. The stresses in this place are unbelievable. If we would have had the same taskings about 10 years ago, we would have had a terrible time trying to deal with it. I remember the '82 reorganization and how much stress there was. I don't see that kind of stress now. I don't think that people now feel threatened by change. They know we have a vision, we believe in each other. Everyone has an opportunity to be an equal player. We want to hear the negatives as well as the positives. I want to see incremental change and improvement. I see change occurring every day because people who own the processes are getting involved in issues. They are able to effect the change we need.

As you go out to the major commands you see exceptionally smooth transitions when the leadership changes. There are no longer major disruptions in a staff because a new commander arrives on the scene. And this is because our admirals are together as a team trained in total quality. They all have the same vision of Navy medicine for the future. How much of a shock is it to a command when you change a leader? The answer to that question will be a measure of how successful we have been in TQL.

It sounds like you're pretty optimistic about where Navy medicine is headed.

In my view, the people we have in leadership positions are superb. They have the right attitude, training, and the right experience to take on the tough issues. I'm excited about the next year and a half. The adoption of our value system a few years ago where we established our guiding principles and made a big point about integrity was absolutely critical. Everything we've done in the past few years has demonstrated our commitment to excellence. We have opened our books to the people looking at Defense medicine. We have not been afraid to show them our statistics and our costs, because we think we're doing a good job. We now have the credibility to forge a new course for the future.—JKH

Naval Medical Research and Development Command Highlights

• Navy Medicine's Marrow Donor Program

Bone marrow transplantation is a method of treating bone marrow suppression caused by leukemia and other malignancies, radiation, or chemical injury. With experienced personnel and the appropriate facilities for bone marrow transplantation research, the Navy was tasked by Congress in 1990 to address tissue typing for patients without related donors and to develop an active Department of Defense (DOD) recruitment program (The C.W. Bill Young Marrow Donor Recruitment and Research Program). Prior to the Navy's involvement in the National Marrow Donor Program (NMDP) the only realistic possibility for a marrow donor was being an HLA (tissue type) matched brother or sister and only 30 percent of patients have matched siblings. As part of this effort to save lives, sophisticated research laboratory-based technology to define HLA type by directly analyzing HLA genes from each donor has been moved to clinical reality through Navy supported research. Over the past few years the precise nucleic acid sequence of many of the HLA types have been discovered. Recently polymerase chain reaction technology has been used to produce billions of copies of the short segment of DNA which codes the specific structure of the part of the chromosome dictating HLA type. The DNA for testing is obtained from a tiny sample of each donor's chromosomes, usually from blood cells but potentially from hair follicles or buccal scraping (inside mouth). Once the specific DNA is copied, it is tested with short pieces of specific nucleic acid unique for HLA types. Today over 1,000 DOD donors are typed each week by the Naval Medical Research Institute, Bethesda, MD, and the NMDP civilian laboratories. And each week a DOD volunteer donor provides marrow for a potentially life-saving transplant. For more information contact CAPT Robert Hartzman, MC, Bone Marrow Registry, DSN 295-1837 or Commercial 301-295-1837.

• CDR Rupert Wins ATD

The Assistant Secretary of Navy (Research, Development, and Acquisition) announced the selection of 14 Advanced Technology Demonstration (ATD) projects that will receive funding beginning in FY95. Among the winners was, "Tactile Interface to Improve Situational Awareness," by CDR Angus Rupert, MC, Naval Aerospace Medical Research Laboratory, Pensacola, FL. CDR Rupert's ATD proposes a new approach to easing the problem of spatial disorientation (SD) in the aviation environment. SD occurs when pilots incorrectly perceive the attitude, altitude, or motion of their aircraft relative to earth—it causes pilots literally to drive their planes into the ground, costing DOD more than $300 million annually in lost aircraft and an immeasurable price in loss of life. The ATD will attempt to demonstrate that spatial orientation can be continuously maintained by providing information from the aircraft attitude sensor to the pilot through the sense of touch. One can envision a torso harness fitted with multiple electronmechanical tactors that continuously update the pilot's awareness of position. Such a tactile interface device would be applicable in naval aircraft and SEAL delivery vehicles, might facilitate target location by sonar and radar operators, and would enhance pilot training in flight simulators. The device could reduce the time pilots currently spend referring to aircraft instruments, increase aviator safety, and support greater mission effectiveness. For more information contact CDR Tim Singer, MSC, NMRDC Research Area Manager, Aviation Medicine and Human Performance, DSN 295-0878 or Commercial 301-295-0878.

• Studies Completed for Push-Pull Effect

Researchers from the Naval Aerospace Medical Research Laboratory (NAMRL), Pensacola, FL, released initial findings that clearly demonstrate significantly reduced positive G tolerance in some individuals immediately following zero or negative G acceleration stress (Push-Pull Effect). The study was made possible by the unique capability of the Coriolis Acceleration Platform (CAP) device used to combine angular and linear acceleration to human subjects. CAP is the only device in the DOD inventory available to study chronic exposure to altered G environments. Prior to this study using male and female Navy volunteers, the importance and incidences of exposure to negative G acceleration stress in aviation had been discussed by aviation professionals including aerobatics and high performance pilots. Because operational situations exist that demand positive G and negative G light maneuvering of current military aircraft this reduced tolerance could lead to a more rapid onset of G-induced loss of consciousness or other forms of incapacitation. Further operational research by NAMRL will be aimed at assessing the risks to aircrew, understanding the relevant physiology, and developing appropriate protective strategies. Educational efforts directed toward aviators and flight surgeons are under way within the Navy and Marine Corps aviation community aimed at increasing awareness of this potential hazard. For more information contact CDR Tim Singer, MSC, NMRDC Research Area Manager, Aviation Medicine and Human Performance, DNS 295-0878 or Commercial 301-295-0878.

Navy Medicine January-February 1944

Jennifer Mitchum

By the close of 1943 the Allies had finally penetrated the Japanese defense perimeter in the central and southern Pacific. The dual offenses of ADM Halsey through the Central Pacific, and GEN MacArthur's northwestern advance toward the Philippines were picking up steam. The recent conquest of the Gilberts provided the eastern stepping stones to Tokyo. In inching toward the Philippines, Allied troops landed at Cape Gloucester in western New Britain.

Cape Gloucester

The fighting at Cape Gloucester, on the northwestern tip of New Britain, mirrored that on Guadalcanal and Bougainville. Troops had to endure "...rainstorms that never let up,...vehicles bogging down,... dirty fighting and general wretchedness."(1) U.S. troops raised the flag on the last day of 1943, but the roughest fighting was yet to come as the Allies moved to rid the nearly 7,500 defenders from the Cape's perimeter and hills.

Despite difficulties, beach medical parties worked diligently treating casualties, and evacuating them with amtracs. Surgical teams, comprised of at least one surgeon and five corpsmen, proved extremely valuable in this operation. Incidentally, the Cape Gloucester operation was believed to be the first time in the Pacific campaign that surgical teams embarked on LSTs (landing ship, tank) and saw the use of the recently installed hospital facility aboard LST-464.

After 16 days of fighting, U.S. troops drove the enemy out. The campaign was costly for both sides; about 3,100 defenders and 240 marines died. Interestingly, 25 men were

A native girl receives treatment at a medical facility on the Majuro Atoll in the Marshall Islands.

LST(H)-464 served as hospital ship in several Pacific operations.

crushed by huge falling trees, an unusual hazard peculiar to tropical rain forests. In addition, 772 Americans were wounded.(2)

LST-464

Because the Allied forces in New Guinea and the Bismarck Archipelago lacked hospital ships, the Navy reconfigured LST-464 to hold a medical facility in the summer of 1943. The tank deck was altered to provide for a ward with 60 bunks in triple tiers. Four surgical beds were available for the seriously ill. Also included were an operating room, sterilizing room, dental office, laboratory, dressing room, and X-ray room. Later, a second ward forward on the tank deck was added along with a sick officer's quarters and a consultation room for outpatients. The medical staff consisted of about 40 corpsmen and 6 medical officers, with additional surgeons and other medical officers assigned during amphibious operations.

Despite carrying a hospital facility, LST-464 was not officially designated as a hospital ship. This meant she was unprotected and unregulated by the Geneva Convention rules. Therefore, LST-464 was afforded no protection by the laws of war, retained her armament, and continued to carry some combat personnel and equipment.

LST-464 was the only LST in the Pacific to be fully reconfigured as a hospital facility. During amphibious operations LST-464 provided care for personnel of small craft lacking medical officers, received and cared for Marine casualties, and provided base hospital facilities for personnel constructing advanced bases.(3)

The Marshalls

The Marshall Islands were a key to ADM Halsey's drive across the Pacific. The Marshalls, comprising 34 atolls and single islands, had been under Japanese mandate for nearly 25 years and were well fortified. The enemy's main defenses were on Wotje, Maloelap, and Mili Atolls. The Japanese's secondary line of defense was on Eniwetok, Kwajalein, and Jaluit. The Americans first attacked Kwajalein and then Eniwetok.

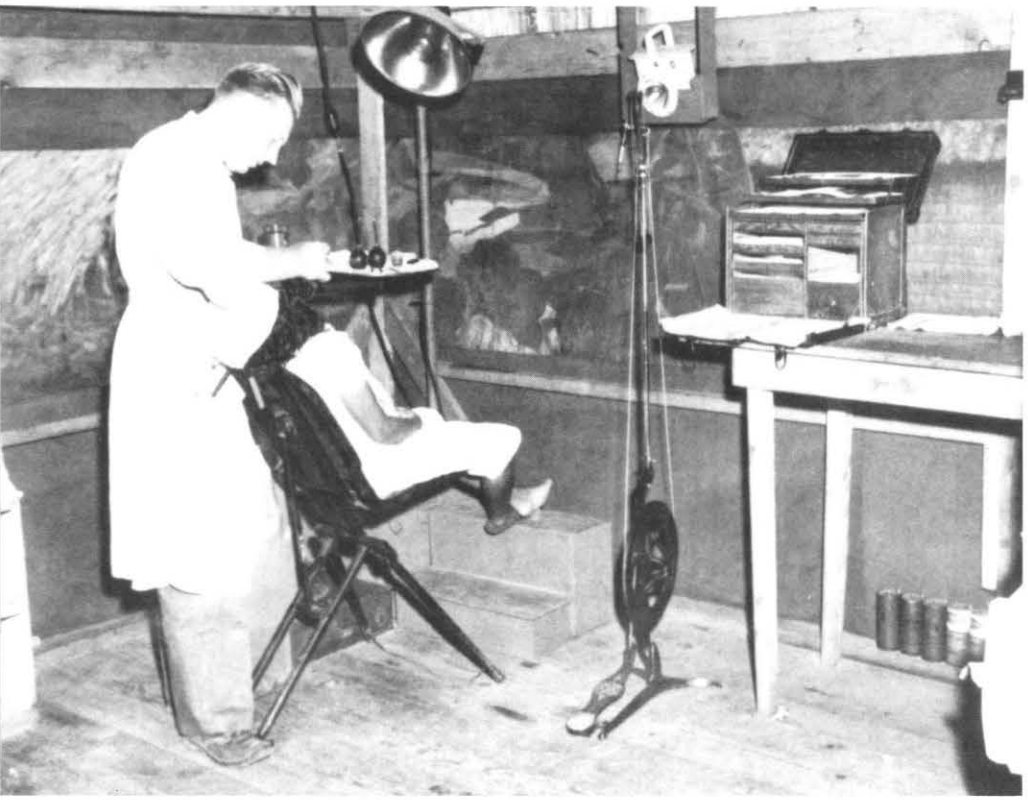
The First Assault

Kwajalein was comprised of more than 90 islands and islets. Japanese air bases were located on the connected islands of Roi and Namur; their naval and seaplane bases were on Kwajalein island and Ebeye, respectively. Therefore, American forces conducted simultaneous amphibious assaults on Roi, Namur, and Kwajalein. The Marines would take Roi and Namur, and the Army, Kwajalein.

American troops landed on and quickly secured some of the smaller islets near Roi, Namur, and Kwajalein to support the principal landings. Casualties remained low and shore party medical sections and battalion aid stations operated relatively smoothly.

Roi and Namur

Appearing to be a "tougher nut to crack then Betio [Tarawa],"(4) Roi and Namur were smaller but more heavily defended with proportionally bigger garrisons. However, a lengthier and more effective preliminary naval and aerial bombardment made the 31 Jan assault comparatively easier than Betio. On Roi, where an airstrip occupied most of the island, enemy opposition was light and there were few American casualties. Troops swept



Navy dentist cares for a native girl on Majuro Atoll as other children peer through the screen in the background.

across the island quickly and occupied it completely by 1 Feb. Namur was more difficult and took an additional day to secure.(5)

Navy medical personnel attached to Marine units carried minimum gear ashore. Battalion aid station inventories included splints, litters, plasma, morphine, sulfa drugs, battle dressings, tourniquets, ophthalmic ointments, stretcher bandages, adhesive tapes, burn ointment, and brandy. Shortly after landing, medical personnel set up battalion aid stations on and near the beaches in deep shell craters, pill boxes, and dugouts. Doctors and corpsmen performed admirably even when under fire.

Two construction battalions (Seabees) also landed in the Roi-Namur operation with a complement of one dentist, four medical officers and eight hospital corpsmen. Initially, there was no rigid medical system in place, so medical personnel who had been attached to the Seabees moved throughout the island treating wounded where needed. On D-Day+3, the Seabee medical battalion on Roi set up a sick bay. Sick call treatments consisted mainly of dressing minor war wounds and coral cuts, tending to wounds caused by accidental shootings, and treating ear fungus infections.

In a Japanese air attack on 12 Feb, 25 men were killed and 130 seriously wounded.(6) Later on that day, Seabees repaired a mess hall for use as a temporary aid and evacuation station. The following day, Seabee medical personnel boarded SS *Typhoon*, which was being used as an emergency hospital ship, with about 60 wounded for evacuation to Hawaii.

Medical Evacuation

Overall, medical evacuation was prompt and efficient. On Roi, corpsmen served as litter bearers and evacuated casualties from battalion aid stations. On Namur, where the casualty rate was greater, bandsmen assisted corpsmen with evacuations. Patients were transferred from transports to hospital ship *Solace* (AH-5) which arrived at Roi on 3 Feb. *Solace* departed for Pearl Harbor the next day with 362 wounded.(7)

Kwajalein Island

As on Tarawa, the Japanese concentrated their defenses along beaches in an integrated and interlocking system of trenches, pillboxes, antitank traps, and blockhouses. Although air and naval preinvasion bombardment inflicted some damage, the Army encountered strong resistance once ashore on 1 Feb. After a tough struggle, the island fell 3 days later.

Since Kwajalein Island and surrounding islets were primarily an Army operation, Navy medical personnel remained aboard ships and rendered care to wounded evacuated from the beaches. The senior medical officer aboard the transport USS *Harry Lee* (AP-17) reported to BUMED that evacuation was usually prompt and adequate first aid had been rendered ashore. DUKWs (amphibious trucks) and boats brought wounded to the ship D-Day+1 through 3. Personnel experienced difficulty removing patients from DUKWs because litter handles extended beneath the overhangs of the gunwales and choppy seas made it difficult to hoist patients aboard. LCVPs (landing craft, vehicle, personnel) proved to be better in transferring casualties onto hospital ships. LCVPs had greater carrying capacity and were more seaworthy.

The hospital ship USS *Relief* (AH-1) received battle casualties on the east side of Carlson Island in

Photos from BUMED Archives

Medical personnel give a wounded marine water and plasma on Eniwetok Atoll in the Marshalls.

Kwajalein Lagoon from USS *Harry Lee* and other vessels. On 4 Feb, *Relief* sailed for Hawaii with 607 patients.(8) In the latter part of February, she would return to the Marshalls, bringing medical supplies for use in establishing shore hospitals on Roi Island. Afterward, she would embark battle casualties from Navy transports and serve as a station hospital at Majuro for 3 months.

Sanitation and Disease

During occupation of the Marshalls, no epidemics or infections from indigenous diseases were reported. At sick call, medical personnel treated many sunburn cases, minor cuts and abrasions, and small pyrogenic skin infections.

Disposing of the dead was an arduous task. On 3 Feb, the Graves Registration Section began searching for the dead. It was difficult to remove the Japanese that had been buried under debris and destroyed fortifications. Most Americans were buried on Aqua Pura, a little speck of land between Roi and Namur.

By 7 Feb the Kwajalein Atoll was in American hands. It was one of the most complicated amphibious campaigns in history—involving landings on 30 different islets, fights on at least 10 of them, and prolonged bloody battles on 4. The price, however, was less than that of the Gilberts. There were few Navy casualties because few vessels were damaged. There were 372 soldiers and marines killed and 1,582 wounded out of 41,446 troops committed.(9) The Japanese, as usual, suffered very heavy casualties, with 7,870 of 8,675 killed.(10)

Eniwetok Atoll

Eniwetok Atoll, comprised of 40 islets, is farther west than Kwajalein, and 1,000 miles from the Marianas. The Americans wanted to use Eniwetok as a staging point in their east to west progress. As at Kwajalein, the enemy's main defenses were on islands in the north and far south. A long coral-surfaced bomber strip with strong defenses was on Engebi (north), and search radars and coast defense guns were on Eniwetok and Parry Islands (south).

The Navy's carrier and surface force raided Truk on 16-17 Feb and Saipan a week later to prevent enemy naval and air interference. After a period of pre-invasion bombardment, troops occupied a few large islets surrounding Engebi on 17 Feb. The next day, about 3,500 Americans landed on Engebi and secured it by late afternoon. Most of the defenders as well as 85 marines were killed and 166 Americans were wounded.(11)

Eniwetok

Unlike Engebi, Eniwetok and Parry Islands proved tougher than the

Americans expected, for enemy defenses had been well camouflaged from reconnaissance. The enemy almost fooled the Americans into thinking Eniwetok and Parry were unoccupied, but intelligence officers found papers on Engebi indicating there were slightly over 800 defenders on Eniwetok and about 1,350 on Parry. Unaware of such defenses, Eniwetok was not heavily bombarded. Troops landed on Eniwetok on 19 Feb and met stiff opposition.

During the height of the battle, doctors and pharmacist's mates aboard ships worked around the clock treating casualties. Medical personnel at sea were overwhelmed with the numbers of casualties. *Solace* arrived at Eniwetok on 21 Feb, picked up 391 casualties, and then returned to Pearl Harbor.(12) Most were Army patients. The Americans finally secured the island on 21 Feb. About 700 defenders had been killed. The Americans had 94 wounded and 37 had either been killed or missing.(13)

Parry Island

United States forces pounded Parry Island for 3 days before troops were put ashore on 22 Feb. Eyewitnesses wondered if there would be anything left when the smoke cleared.(14) There was plenty. Enemy emplacements were so well camouflaged that the Americans found many of them only by stumbling upon them. Japanese antitank guns and mines inflicted horrific wounds. The worst cases were transferred to *Solace* shortly after being wounded for more definitive treatment. Luckily, many survived due to exceptional medical care. By late evening on 22 Feb, Parry Island was secure but at great cost with more than twice as many casualties than at Eniwetok. The Allied had 73 killed and missing and 261 wounded.(15) More than 1,000 defenders had died.

Elsewhere

As the war progressed, the Navy Medical Department continued to expand to meet the ever-increasing need. In preparation for the upcoming Normandy invasion, three additional dispensaries with bed capacities ranging from 46 to 800, were established in the United Kingdom. In addition, the Navy took over the Royal Victoria Military Hospital in England on 28 Feb and established it as Base Hospital No. 12. In CONUS, a neuropsychiatric center for patients suffering from fatigue and stress was under construction in San Leandro, CA.

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Photorefractive Surgery in the Navy

LCDR Steven Schallhorn, MC, USN

The issue of refractive surgery in the Navy has been raised many times in the last several years following increased public and scientific acceptance of radial keratotomy. Recently, refractive surgery has expanded with the promising results of the excimer laser* in a procedure called photorefractive keratectomy. This computerized laser offers a completely different approach to correcting nearsightedness (myopia). Because of its ability to improve uncorrected visual acuity, it could enhance the performance of myopic military individuals. This could be especially important to those members, such as Navy divers, that operate in environments not conducive to either glasses or contact lenses.

Photorefractive keratectomy (PRK) is a surgical procedure in which a computer controlled excimer laser (193-nm ultraviolet light) is used to sculpt the cornea to correct nearsightedness. It is currently in the final phase of FDA testing and hence still considered experimental. PRK effectively treats myopia as reported in early clinical trials,(*1-4*) FDA phase IIB and ongoing phase III trials,(*5-8*) and in large overseas studies.(*9,10*) It combines excellent visual results with minimal complications.

Many of the military operational concerns of PRK have not been fully addressed by civilian studies. None of the previous and ongoing studies have adequately examined night vision, specifically glare and contrast sensitivity. The Naval Medical Center San Diego, CA, in conjunction with the Naval Health Research Center is taking part in these nationwide trials using active duty Navy and Marine Corps volunteers.

This study will be performed as part of the phase III clinical trials and will quantitate the glare effect of PRK over a 2-year period. It will do this by examining the contribution of PRK to intraocular light scatter and its effect on contrast sensitivity under glare conditions. A functional military visual task will also be used to obtain a correlation between visual results and performance. The Summit Technology excimer laser will be used with the guidance of Dr. Michael Gordon, a renowned expert in the field of refractive surgery.

Dr. John Sutphin, former specialty advisor to the Surgeon General and chairman of the ophthalmology department, Naval Medical Center San Diego, and Dr. Samuel Fulcher former Navy ophthalmologist are both instrumental in laying the groundwork for this project. Formal tasking for the evaluation of PRK in the Navy was established by the Naval Special Warfare Command with the guidance and forethought of CAPT Frank Butler, Biomedical Research Director. Initial funding was provided by the Office of Naval Research managed by Jody Wood, Naval Special Warfare technology area program manager, and CDR Tim Singer of the Naval Medical Research and Development Command. Funding has transitioned to block 63 funds under SORDAC (Special Operations Research, Development and Acquisition Center).

The study protocol is entitled "Glare Disability After Photorefractive Keratectomy" and is a subset of the overall clinical trials of the Summit excimer laser under FDA IDE G880210. It has been reviewed and approved by the scientific and human use committees of all participants: Naval Medical Center San Diego (CIP S-93-027), Navy Health Research

*Caution: the excimer laser is an investigational device. It is limited by U.S. Federal law to investigational use.

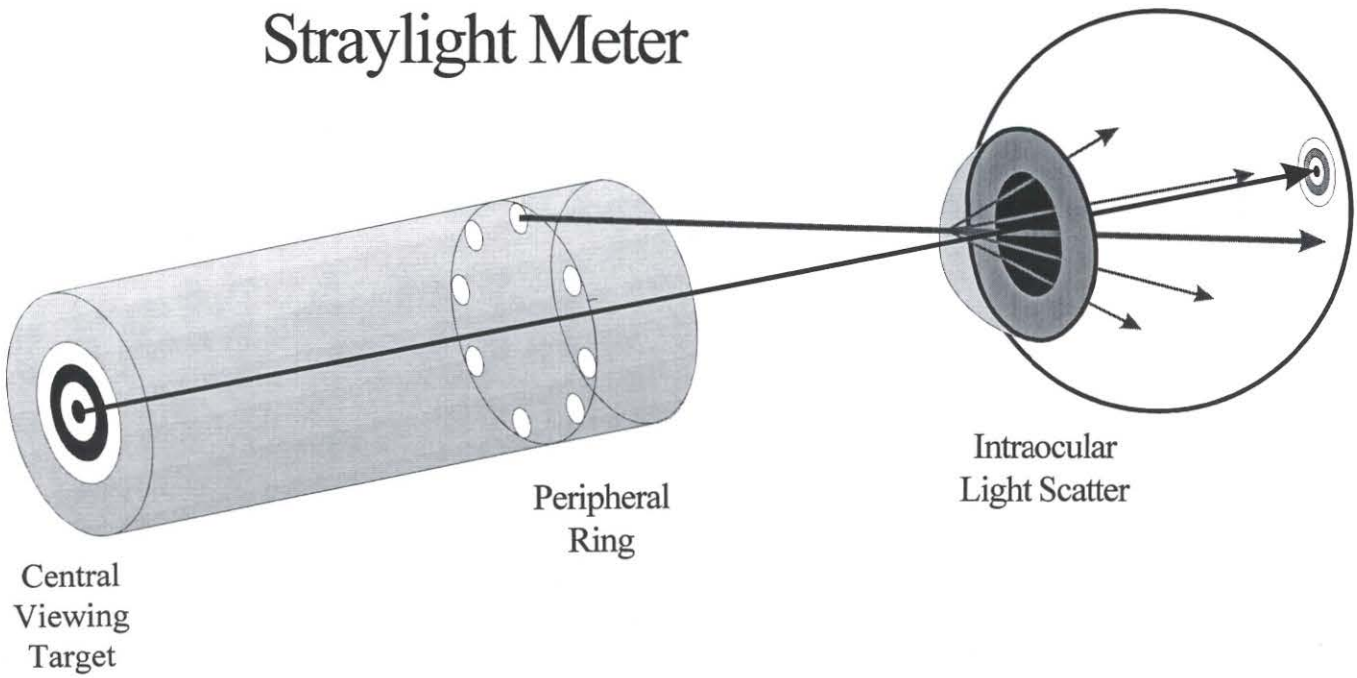


Figure 1. **Light from the peripheral ring is scattered by optical imperfections of the eye. Some of this scattered light falls on the fovea which is viewing the central target. When the peripheral ring flickers, the central target also appears to flicker faintly dependent on the amount of intraocular light scatter.** Graphic by CDR Jim Tidwell, MC.

Center, and Mission Bay Hospital (Dr. Gordon's institutional review board). The principal investigator is LCDR Steve Schallhorn, staff ophthalmologist at the Naval Medical Center San Diego. Co-investigator is LCDR Chris Blanton, staff ophthalmologist also at NMC San Diego.

Enrollment Criteria

Basic, simplified eligibility requirements included a stable refractive error between -1.5 and -6 diopters with no more than one diopter of astigmatism, no significant ocular conditions, 21 years of age or older, active duty and in good general health. All of the participants expressed dissatisfaction/intolerance to conventional methods of correcting their nearsightedness. This ranged from multiple episodes of microbial keratitis associated with contact lens use to difficulty swimming/diving with either glasses or contacts.

Command approval was obtained for participation to ensure availability for the 2 years of followup. Due to the possibility of a bothersome difference in refractive error between the two eyes after the laser procedure, all volunteers had the ability to wear a contact lens in the unoperated eye. Except for aviators, there were no restrictions on rate or specialty. A waiver procedure was established in case any of the participants fell outside of in-rate visual requirements after the surgery.

The first 30 active duty Navy/Marine personnel who met enrollment criteria were entered into the study. The pool was enormous as thousands of calls were received after a single request for volunteers. Informed consent was obtained after an extensive brief on photorefractive keratectomy

Preoperative Examination

Review of medical history
Comprehensive patient questionnaire
Uncorrected and best corrected distant and near visual acuity
Manifest, cycloplegic, and synthetic aperture refraction
Pupil diameter with high and low levels of luminance
Keratometry
Keratoscopy
Intraocular pressure
Slit lamp and dilated exam
Contrast sensitivity with and without a glare source
Contrast acuity with and without a glare source
Intraocular straylight

Table 1

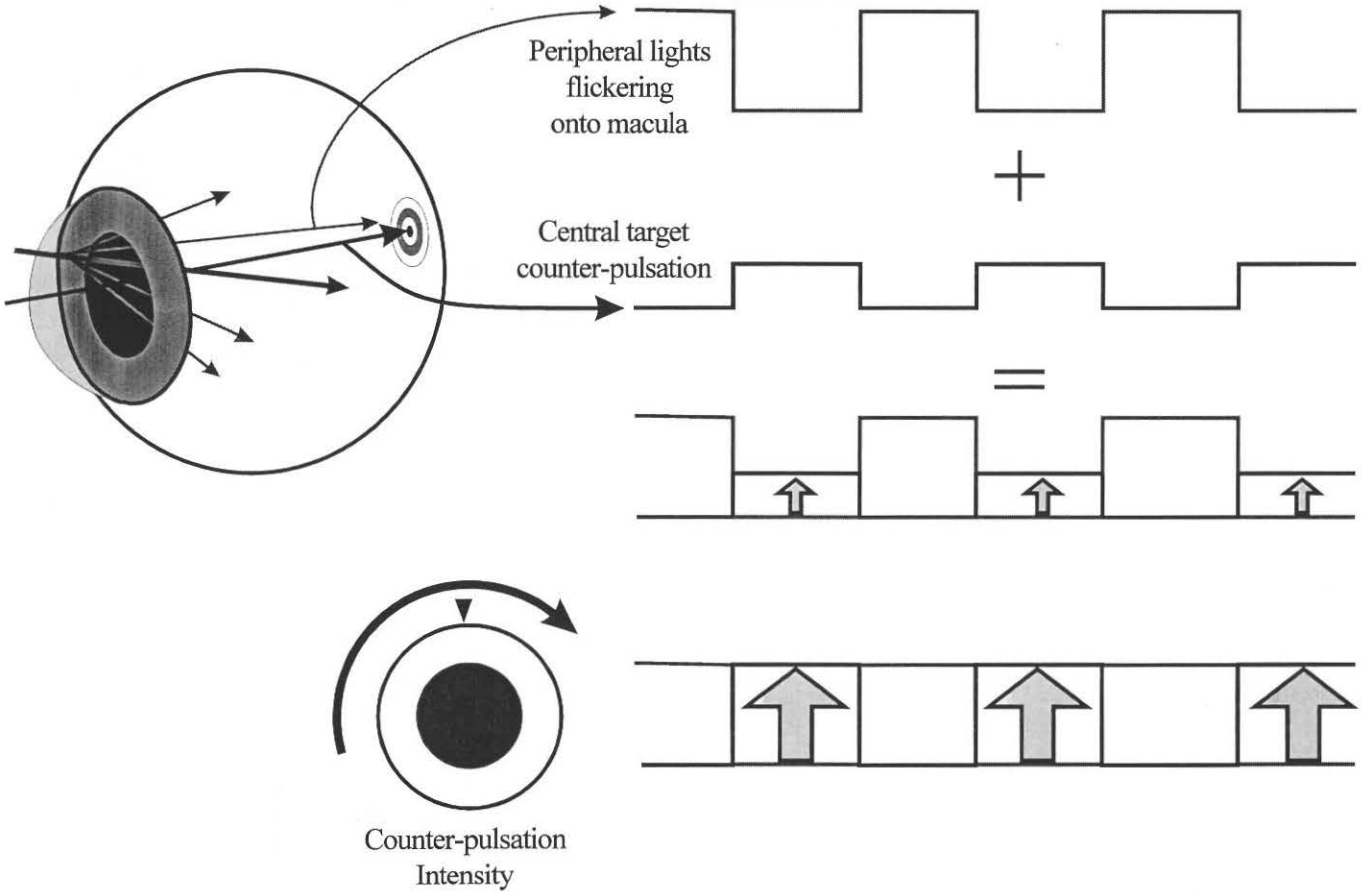


Figure 2. **When the luminance of the central counter-pulsation equals the flickering of the peripheral ring on the macula, the central target will stop flashing. The amount of counter pulsation required to do this will be directly related to the intraocular straylight.** Graphic by CDR Jim Tidwell, MC.

including risks, benefits, and alternatives. The investigational nature of this study was explained in detail.

Preoperative Examination

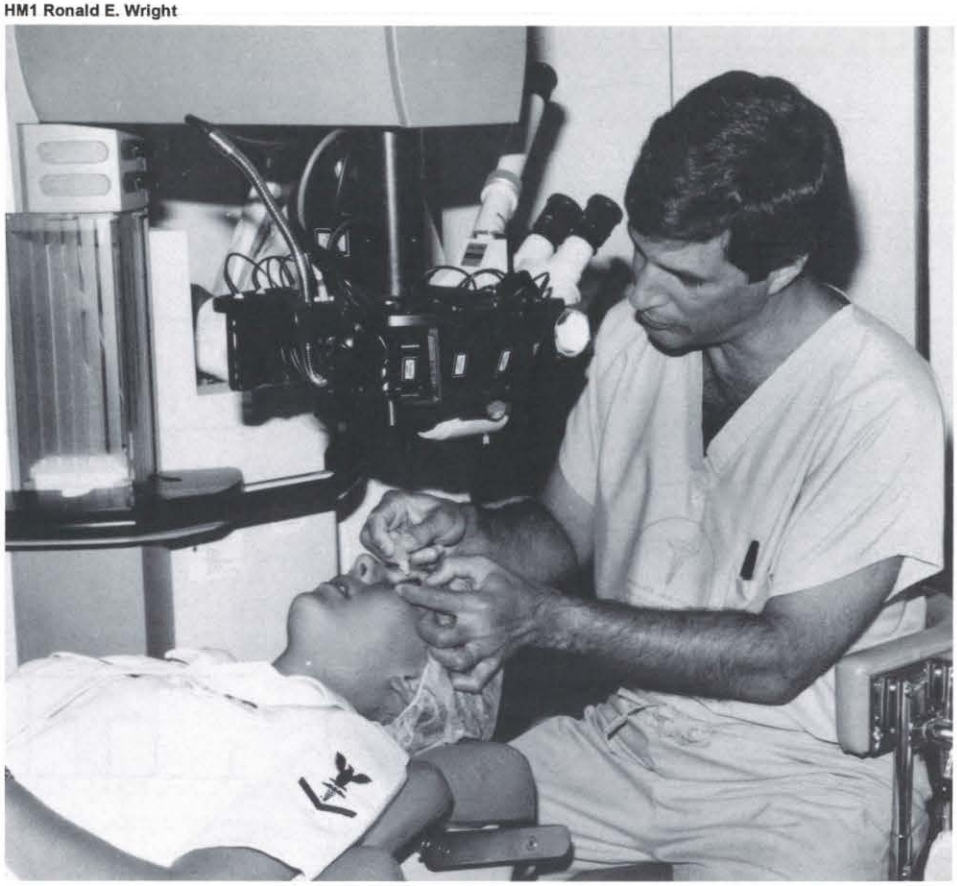
The preoperative examination consisted of a combination of standardized, nationwide PRK and Navy specific tests as listed in Table 1. The Navy tests were carefully selected to rigorously evaluate glare and contrast sensitivity. One of these will be discussed in detail.

Glare can cause disability by reducing an object's perceived contrast. It does this by scattering the glaring light source over the macula thus reducing the difference in luminance of the viewed object relative to the background. The scattered light can come from extra ocular sources such as dirty glasses or intraocular such as the cornea. Light scatter after PRK might come from the faint stromal haze that is common after the procedure (but which typically resolves in several months) or from the creation of two different optical zones (a central optically corrected zone and a peripheral uncorrected).

The straylight meter was recently developed by Dr. T.J.T.P. van den Berg.(*11-13*) Its ingenious, landmark design gives it the unique ability to measure analytically the glare producing intraocular light scatter. In this device, an eccentric light source and a central fixation area are counter pulsed at a frequency of 8 cycles per second. The eccentric light is a ring of point lights. There are three of these rings at 3.5, 10, and 28 degrees off of the fixed central viewing area. The subject fixates on this central target while a set of ring lights are flashed. With no counter flashing, the central area will appear to flicker due to the intraocular light scatter from the eccentric source as shown in Figure 1. By adjusting the intensity of the counter pulsation, the flickering of the fixation point can be extinguished.

The luminance which minimizes the central flicker is directly related to the amount of intraocular light scatter, demonstrated in Figure 2. In this device the retina is used as a null instrument so that neural adaptive changes and levels of retinal sensi-

HM1 Ronald E. Wright



Dr. Michael Gordon performs the photorefractive keratectomy (PRK) on HM3 Tiffany Baisden using the excimer laser. Here he applies drops during the procedure.

tivity are irrelevant. It is not necessary to correct refractive error as long as the central area can be seen. The straylight meter has been shown to be a sensitive measure of intraocular light scatter in patients wearing contact lenses,(*14*) cataracts and corneal dystrophy's,(*15,16*) and in patients that have undergone radial keratotomy.(*17*) Normal age-dependent values have also been established.(*18*) In a comparison of commonly used glare testers,(*19*) the straylight meter was used as the benchmark measurement of intraocular scatter against which all other devices were tested.

In addition to the above tests, the overall visual effects of PRK in the context of the military is being examined by measuring rifle shooting accuracy. All patients had their rifle shooting accuracy (RSA) assessed using the Noptel ST-1000 laser acquisition system.(*20*) This device consists of a class I laser transmitter mounted on the barrel of a M16A2 rifle with a laser receiver/target on a tripod placed 10 meters away. The scoring is computer controlled which maintains a patient data base. This laser system has been used as a training aide and as a research tool for the military.(*21,22*)

The examinations were conducted under the guidance of Dr. Hal Goforth at the Navy Health Research Center, San Diego. The subjects underwent several training periods until a baseline was established. Scored sessions measured RSA for uncorrected and best corrected visual acuity. This test will be repeated at 6 and 12 months following the procedure. (Table 2)

Demographics and Preoperative Measurements

Number of patients		30
Age		33.2 (25-46 years)
Sex	Male	25 (83%)
	Female	5 (17%)
Service	Navy	28 (93%)
	Marine	2 (7%)
Rank/rate	Officer	9 (30%) O-2 to O-5
	Enlisted	21 (70%) E-3 to E-9
	Rates	BM, BT, EM, ET, EW, HM, RM
Spherical equivalent		-3.30 ±1.05 (-2.0 to -5.50 diopters)
Astigmatism		-.46 ±.35 (0 to -1.0 diopters)

Table 2

Laser Procedure

Twenty-nine of the 30 patients successfully underwent photorefractive keratectomy on 25 Aug or 1 Sept 1993. The remaining patient had the procedure performed on 1 Oct 1993. When there was a visual preference for one eye, such as the eye used for aiming, and both eyes met the inclu-

sion criteria, the nondominant eye was selected for the operation. In accordance with FDA guidelines, after 6 months the patient may elect to have the procedure performed in the other eye.

The procedure is performed under topical anesthesia with a lid speculum in place. After the patient is aligned in the operating chair with the surgeon's coaxial microscope, a series of training exercises are conducted. The epithelium is then gently removed with a spatula over a 7- to 8-millimeter area. Critical centration is maintained by the patient fixating on a central image and is continually confirmed by the surgeon. The diopteric corrective power is entered into the computer and a 6-millimeter optical zone ablation is performed. The average ablation time is less than 20 seconds while the total operation time per patient is approximately 5 minutes. Tobradex™ ointment is then instilled and the eye is patched overnight. The patient is seen regularly until the epithelium is healed.

Preliminary Results

One-month results have been collected on 29 patients. While the data is being assimilated for most of the tests performed and not available, the distant visual acuity results are shown in Table 3. No statistical analysis has yet been performed. *All patients experienced a significant and impressive improvement in their uncorrected visual acuity.* Many patients had uncorrected visual acuity equal to or better than their preoperative best corrected acuity. Twenty-three of 29 patients (80 percent) achieved 20/20 or better *uncorrected vision* and 28 of 29 (97 percent) were 20/32 or better compared to 0 percent preop.

There were no adverse outcomes or complications; however at 1 month, one patient had a best corrected visual acuity of less than 20/20 and that was 20/25. It must be stressed that this 1-month data is a very early look at PRK results. The eyes are still healing from the surgery and further improvement in visual function is expected. Differences between pre and postoperative best corrected visual acuities will be followed closely. All patients are enthusiastic about their new vision and are eager to receive treatment in the other eye. (Table 3)

Most of the patients experienced pain in the early postoperative period as is common after the procedure. Oral narcotic analgesics were prescribed. The pain intensity was consistent with the size of the epithelial defect and was dramatically reduced by the second postoperative day. It resolved when the epithelium healed which occurred by 72 hours in 26 of 29 subjects (87 percent). The remaining three patients epithelialized by 6 days. The patients received 4 to 6 days of convalescent leave and all were able to return to work afterward. Fluorometholone .1 percent drops were then prescribed four times a day. Nonsteroidal eye drops were not used.

HM1 Ronald E. Wright

HM3 Baisden wears a patch following her surgery.

Because of the new difference in refractive error between the two eyes, most of the patients preferred to wear a contact lens in the nonoperated eye. Those that were not previous contact lens users were provided with disposable lenses, detailed instructions, and a solution kit.

Nomograms used for the laser ablation adjust for regression which occurs in the first several postoperative months by slightly overcorrecting the programmed refractive error. All patients were appropriately overcorrected by approximately 1 diopter at 1-month followup visit. This caused difficulty reading in several patients that was most apparent in individuals over 35 years old. They were pro-

One Month Visual Acuity Results

	Uncorrected Vision		Best Corrected Vision	
Snellen Acuity	Pre-op	1 mo Post-op	Pre-op	1 mo Post-op
20/10-20/20	0	23 (80%)	29 (100%)	28 (97%)
20/25-20/32	0	5 (17%)	0	1 (3%)
20/40-20/80	2 (7%)	1 (3%)	0	0
20/100-20/200	18 (62%)	0	0	0
≥20/400	9 (31%)	0	0	0

Table 3

Pat Kelly, Naval Medical Center Public Affairs, San Diego, CA

The author examines HM3 Baisden's eye 5 days following her history-making surgery.

vided reading glasses which resolved their difficulties.

Patients will be examined again at 2, 3, 4, 6, 9, 12, 18, and 24 months following the procedure. The patient's nonoperated eye will serve as control. Testing will be similar to the preoperative exam with results added to the nationwide data bank establishing the safety and efficacy of the surgery. The quality of vision under glare and low contrast conditions can be assessed using the specialized tests. The results can be correlated with a military relevant task using the rifle shooting accuracy. A comprehensive analysis of results will be performed at 6, 12, and 24 months.

While these early and preliminary results are very encouraging, further careful evaluation of PRK over the course of this study and other ongoing civilian studies is needed. The eventual role of photorefractive keratectomy in the military is difficult to predict but the potential benefit is too great to ignore. It is likely that this study will have major implications regarding refractive surgery in the Navy.

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Naval Health Sciences Education and Training Command (HSETC) Highlights

This is the first of a series of announcements from HSETC that will appear in each issue of Navy Medicine.

● Medical Education and Training Consolidated

Responsibility for Medical Department education and training policy and execution is now consolidated under HSETC's commanding officer. CAPT James F. Bates, MSC, commanding officer, now serves as the Surgeon General's Special Assistant for Education and Training (MED-09T), advising him on all educational matters.

This organizational realignment shifts training functions and assets from the Bureau of Medicine and Surgery (MED-53) to HSETC. HSETC Training Program Managers (TPMs) have responsibility for coordinating all aspects of a cluster of related training programs. The TPM manages program resources, oversees curriculum development, evaluates training, and maintains liaison with all others who have an interest or role in the program.

● Joint-Service GME Selection Board

HSETC hosted the first Joint-Service Graduate Medical Education Selection Board 29 Nov-3 Dec 1993 at the Crystal City Marriott, Arlington, VA. Five hundred Army, Navy, and Air Force program directors, specialty advisors, and support staff selected nearly 2,000 physicians for internship and residency training. While each service's selection board met separately, this joint meeting enabled coordination to ensure all training billets were filled.

Under the leadership of RADM Frederic G. Sanford, MC, commanding officer at Naval Medical Center Oakland, CA, the Navy selection board accomplished the following:

—Filled every in-service resident position for the first time in 4 years.

—Increased primary care selections by 50 percent.

—Selected 11 interns, 20 residents, and 7 fellows for interservice Army and Air Force programs. In addition, 22 applicants were selected for full-time out-service training for programs not available in the military.

First-time use of Additional Qualification Designators (AQDs) denoting an applicant's subspecialty allowed the board to select applicants for critical subspecialties. In another first, applicants for flight surgery and undersea medicine were selected by their respective community representatives at the GME selection board.

The board results were released 4 days after adjournment (NAVADMIN message #222/93 CNO WASHINGTONDC 091931ZDEC93), thanks to the hard work and expertise of Kathy Resling, HSETC; LCDR Rich Foster, Naval Hospital Cherry Point; and LT Tracy Kolosik, BUPERS 4415P.

The Army will hold the 1994 selection board in late November in the Washington, DC, area.

● Command Education and Training Coordinators' Seminar

HSETC sponsored the third annual Command Education and Training Coordinators' Seminar (CETCS) 6-10 Dec 1993 at the Fair Oaks Holiday Inn, Fairfax, VA. Seventy officers, 18 enlisted, and 4 civilian Medical Department educators from more than 50 medical and dental treatment facilities and educational commands attended.

RADM Mariann Stratton, NC, Assistant Chief for Personnel Management, BUMED, and Director, Navy Nurse Corps, welcomed the participants in her keynote address highlighting education's important role in Navy medicine.

The seminar provided a forum for command education and training programs and program management. Educators had the opportunity to share their expertise, knowledge, and "lessons learned" with their peers, as well as with those who determine and oversee policy execution.

The group developed Quality Improvement Opportunity Statements and established working groups to gather data and work the following major issues:

(1) Standardized Lesson Training Guides (LTGs) for required training.

(2) Standardized course codes for the Standardized Personnel Management System (SPMS).

(3) Emergency medical technician (EMT) training requirements.

(4) Education and Training Department staffing standards.

(5) Consolidation of command training program requirements.

The participants, in verbal and written feedback, proclaimed the seminar an overwhelming success. Planning for the 1994 CETCS will begin soon. For more information contact CDR Larry Hicks, NC, at HSETC Code 28, DNS 295-2351 or Commercial (301) 295-2351.

Anyone with suggestions for Navy medical education and training issues should call CDR Kramer, DSN 295-0776 or Commercial (301) 295-0776.

John H. Bradley, the last surviving member of the group that raised the flag at Iwo Jima died 11 Jan 1994. He was 70 years old.

John Bradley, a 2nd class pharmacist's mate, was assigned to the 28th Marines for the invasion of Iwo Jima. On 23 Feb 1944, he was on the peak of Mount Suribachi, the highest point on Iwo Jima, when he noticed that the Marines who were raising the flag needed assistance. Bradley quickly stepped forward and was immortalized in Joe Rosenthal's famous photograph below (he is second from the right).

Bradley would serve with distinction on Iwo Jima, winning the Navy Cross for extraordinary heroism in treating wounded under fire. Unfortunately, he was wounded on 12 March, amid the intense fighting which continued on the island. The severity of his wounds forced his evacuation to the United States. He was medically discharged from the Navy later in 1945. Bradley then worked in the family funeral home in Antigo, WI.

CAPT **John H. Ebersole**, MC (Ret.), who assisted in the autopsy of President John F. Kennedy, died in September 1993 at his home in Lancaster, PA, after a brief illness. He was 68.

In November 1963, as chief of diagnostic radiology at Naval Hospital Bethesda, MD, CAPT Ebersole assisted at President Kennedy's autopsy. In a 1978 newspaper interview, before leaving to testify before Congress about the assassination, Dr. Ebersole broke a 15-year silence on the President's death.

"I would say unequivocally the bullet (that killed Kennedy) came from the side or back. The front of the body, except for a very slight bruise above the right eye on the forehead, was absolutely intact. It was the back of the head that was blown off."

Born in Sterling, IL, CAPT Ebersole graduated from St. Ambrose College and received his medical degree from Indiana University at the age of 23. He completed postdoctoral studies in nuclear physics at Duke Univer-

Photo by the Editor

sity and Oak Ridge National Laboratory.

Dr. Ebersole had a 24-year career in the Medical Corps and was the first officer to serve aboard two nuclear submarines. After completing deep-sea diving school and Officer's Submarine School, he was selected by Admiral Hyman Rickover to be the medical officer aboard the world's first nuclear-powered submarine, the USS *Nautilus*. Following a 2-year tour of duty, he was assigned to the second nuclear submarine, USS *Seawolf*, which was the first ship to stay submerged for 60 days.

Subsequently, Dr. Ebersole served as consultant to the National Aeronautics and Space Administration (NASA) for Project Mercury from 1958 to 1961. He then completed a residency at the Naval Hospital, Bethesda, MD, and was named chief of radiation therapy, director of nuclear medicine training, and acting director of the Radiation Exposure Evaluation Laboratory. Subsequently, he served as chief of diagnostic radiology, and was promoted to chief of radiology at Bethesda in 1968.

Two years later, he retired from the Navy and moved to Lancaster, PA, to create and direct the John Hale Steinman Cancer Center at Lancaster General Hospital, the county's first radiation treatment center. He guided the center through several expansions and lectured throughout the United States and Europe on nuclear technology and cancer treatment. He retired as director of radiation oncology in 1986. From 1974 to 1990, he also taught in Lancaster General's Clinical Pastoral Education Program.

Following his retirement, Dr. Ebersole pursued his interest in crime fiction, which began during his years of internship in the 1960's. He attended conferences at Oxford University in England and taught a course on detective fiction through Franklin and Marshall College's Et Cetera Program. He also helped form the Orange Street Improbables, a group of mystery enthusiasts.

He was a member of the American Medical Association, the Society of Nuclear Medicine, the Health Physics Society, the Association of Military Surgeons of the United States, and the Mystery Writers of America. He was also a diplomate and fellow of the American College of Radiology, and served as guest examiner on the American Board of Radiology in 1967, 1970, and 1971. His medals and honors included the U.S. Navy Unit Citation; Award of Merit, Illinois State Medical Society; Merit Citation, Royal Naval Society of Sweden; American Medical Association's Aerospace Medicine Honor Citation; and the Gorgas Medal for outstanding work in preventive medicine in the field of radiobiology and nuclear submarine development.

LCDR **Nancy E.G. Lopes**, MSC, died 16 Dec 1993.

A native of Winnipeg, Manitoba, Canada, LCDR Lopes served the Navy for 20 years. As a pharmacy technician in the Hospital Corps, she was assigned to Naval Hospitals San Diego, CA; Yokosuka, Japan; and Long Beach, CA. She was commissioned in the Medical Service Corps in 1983 and served in Naval Hospitals Groton, CT; Portsmouth, VA; Bremerton, WA; and the Alcohol Rehabilitation Center in Pearl Harbor, HI.

Since September 1992, LCDR Lopes had served as the Strategic Medical Readiness and Contingency Course Director at the Naval School of Health Sciences, Bethesda, MD.

CAPT **R. Conway O'Connor**, CHC, died 17 Dec 1993 in Bethesda, MD, after a long illness.

CAPT R. Conway O'Connor, CHC

A native Chicagoan, CAPT O'Connor attended Quigley Preparatory Seminary in Chicago, IL, and received his bachelor of arts and masters degrees at the St. Mary of the Lake Seminary in Mundelein, IL. In 1960, he was ordained and served as associate pastor of the St. Catherine of Genoa Roman Catholic Church in Chicago and subsequently at St. Luke Roman Catholic Church in River Forest, IL, in the same position.

In 1967, he was commissioned in the Chaplain Corps, U.S. Naval Reserve. From February 1966 to August 1971, he was part of the Navy Ready Reserve. In September 1971, Chaplain O'Connor attended Chaplain School in Newport, RI, and later returned to the school to take advanced training courses for senior chaplains. He also enhanced his counseling skills in the Clinical Pastoral Education Program, Naval Regional Medical Center (NRMC) San Diego, CA.

He assumed several posts including 3rd Marine Division Fleet Marine Force Pacific, Naha, Okinawa; NRMC Philadelphia, PA; Naval Support Office La Maddalena, Italy; Navy Training Center Great Lakes, IL; Naval Air Station (NAS) Cubi Point; NAS Bermuda; and Naval

Weapons Station, Charleston, SC.

From 1985-1987, he was chaplain on staff at the National Naval Medical Center (NNMC) Bethesda, MD. From 1987-1989, he served as director of Pastoral Care Service at NNMC before becoming claimant chaplain at the Bureau of Medicine and Surgery, Washington, DC. CAPT O'Connor was one of 12 claimant chaplains in the Chaplain Corps and served as the senior chaplain for all chaplains at Navy medical facilities. Following his tour at BUMED, Chaplain O'Connor served at the Naval Station Rota, Spain. In 1991, he was made an honorary nurse in the Nurse Corps.

His decorations and honors included the Navy Commendation Medal; Meritorious Service Medal; Legion of Merit; National Defense Service Medal; Meritorious Unit Citation, Republic of Vietnam; Meritorious Unit Citation; Philippine Presidential Unit Citation; Republic of Vietnam Meritorious Unit Citation (Civil Actions Medal 1st Class Color w/Palm); and the Humanitarian Service Medal (two awards).

BUMED Archives

CAPT Alfred L. Smith, MC

CAPT **Alfred L. Smith,** MC (Ret.), died on 7 Nov 1993 in Richmond, VA. Dr. Smith served during World War II and was a prisoner of war for nearly 3 years.* He was 83.

Dr. Smith was born in Lyman, ME. He graduated from the University of Virginia Medical School and entered the Navy Medical Corps in 1937. He was assigned to the Asiatic Squadron and eventually ended up with the Yangtze Patrol on USS *Luzon. Luzon* left China in November 1941 and arrived at Manila on 4 Dec 1941. After the old river patrol boat ran out of fuel, Smith went to Corregidor in early 1942. When the island fortress finally fell to the Japanese in May 1942, he was taken prisoner and spent the next 33 months as a POW, mostly at Bilibid prison in Manila. Smith quickly developed health problems, including partial blindness, caused by the poor diet and lack of vitamins. However, unlike so many others, he survived until rescued by the returning American forces in February 1945.

Upon returning home, Dr. Smith was hospitalized at the Naval Medical Center, Bethesda, MD, for 16 months. He was then declared unfit for further duty and retired in 1946 with the Bronze Star and Purple Heart. Luckily, he regained enough of his sight to allow him to return to medicine. He became a fellow of the American College of Physicians and also maintained a private practice while working part-time for the Chesapeake and Ohio Railroad for over 26 years. Eventually he became the medical director of the Federal Reserve in Richmond, VA.

Dr. Smith was the first participant in the Bureau of Medicine and Surgery's oral history program. He was a dedicated physician and a true friend of Navy medicine.

* * *

*See "Guest of the Emperor," *Navy Medicine*, January-February 1986.

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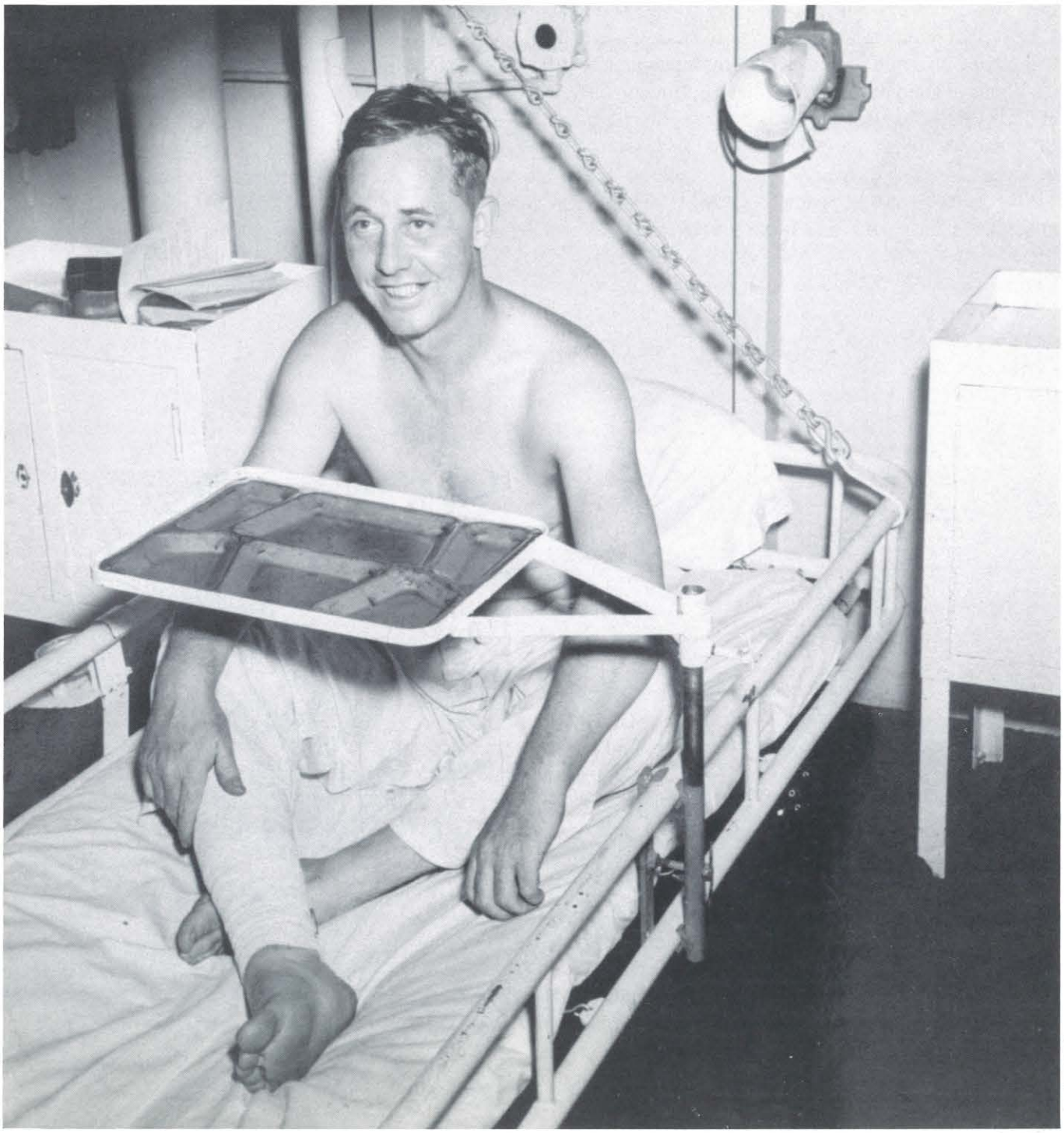

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In the sick bay of USS *Makassar Strait* (CVE-91), patients were assured that eating trays could be converted into writing tables.

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